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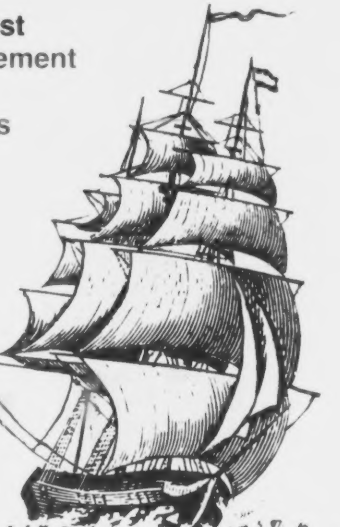

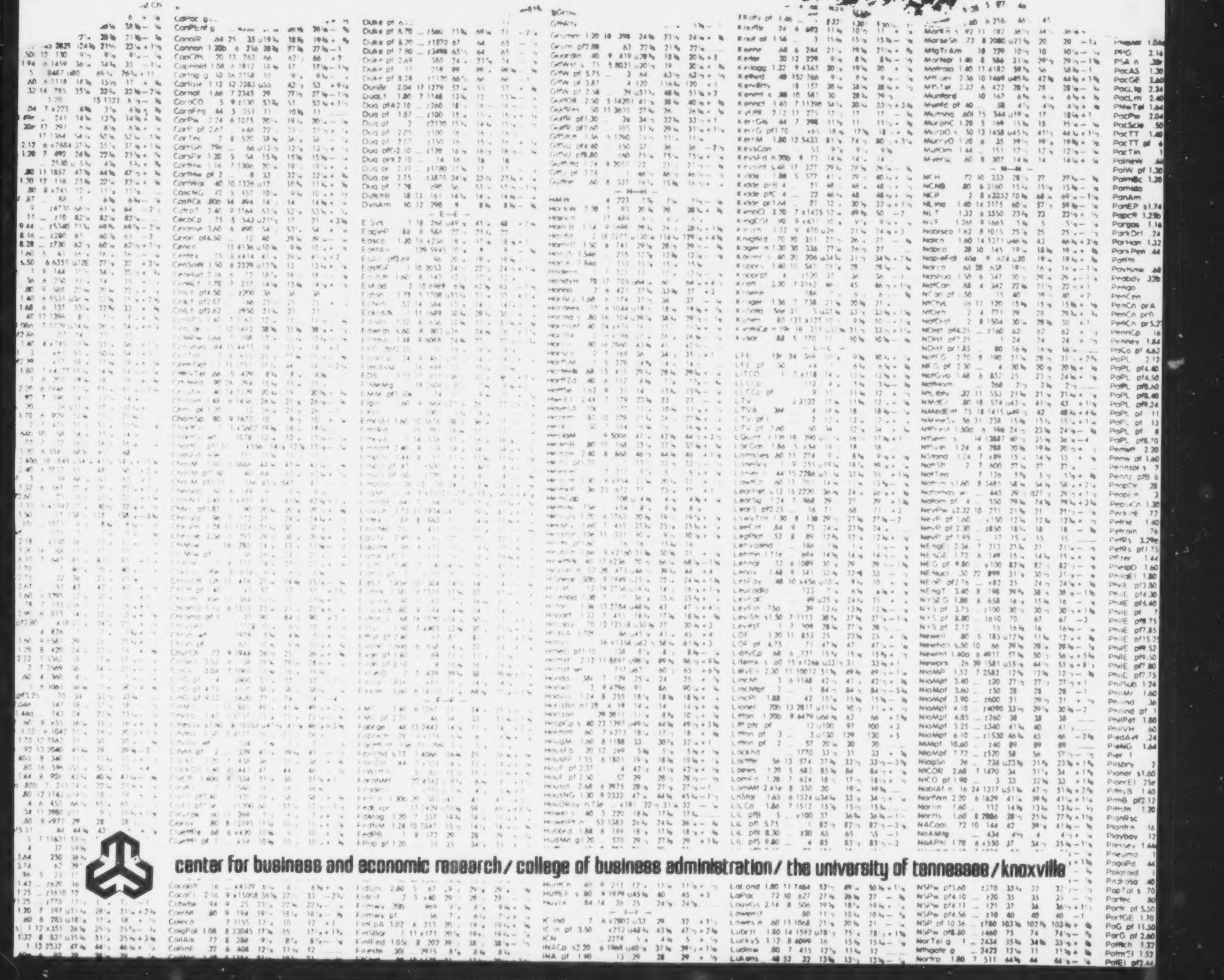

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In Memoriam: Ronald H. Wolf

The students, faculty, and staff of the College of Business Administration record with great regret the death of Ronald H. Wolf, a treasured member of the economics faculty since 1958.

A native of Seattle, Washington, Wolf was graduated from the University of Washington in 1939 with a major in economics. After his graduation, he was employed for a number of years in the Personnel Department of Boeing Aircraft Company. He returned to his *alma mater* as a full-time graduate student in 1949 and was awarded the degree of Master of Arts in Economics in the same year.

During his years of study and work, Wolf became increasingly concerned with what appeared to him as a conflict between the ethical commands of Christianity and the economic commands of capitalism. In his search for a clarification of this issue, he entered Union Theological Seminary in New York City. Partly under the influence of Reinhold Niebuhr, Wolf decided upon a career in applied ethics rather than in theology. This required, however, that he obtain a mastery of those weapons that are employed in attacks on live ethical problems. After two years of reflection in nonacademic pursuits following his graduation with the degree of Bachelor of Divinity in 1952, he had no doubt about the location of these weapons: in his opinion, they were stored in the economist's tool box. Wolf was particularly interested in those analytical instruments which were forged for the purpose of explaining market processes with a view to their improvement for the sake of enhancing economic justice and human welfare.

Wolf had no difficulty, therefore, in selecting a program of study leading to the doctorate in economics. He chose the program at Vanderbilt University in order to study under the guidance of George W. Stocking, an authority in the fields of industrial organization, workable competition, antitrust policy, and government regulation.

Upon his completion of the residence requirements for the degree of Doctor of Philosophy in 1958, Wolf took a position as Assistant Professor of Economics at The University of Tennessee, Knoxville. He received the doctorate in 1962 and was promoted to the ranks of Associate Professor and Professor in 1964 and 1970, respectively.

Wolf was a dedicated scholar who devoted his professional life to the furtherance, practical application, and teaching of the principles of economics. He sought to contribute to the advancement of his chosen field through the authorship of papers and articles and via his coauthorship of text books. Along with his coauthor, Dr. Vernon Mund, he had just completed a new text manuscript in June. He endeavored to apply analytical tools to practical problems in his capacity as a consultant to regulatory agencies and as an expert witness in antitrust cases and before legislative committees. Wolf, however, viewed his research and consultative activities as integral parts of his chief mission: *teaching*. And there has hardly ever been a person in academe who took teaching as seriously as did Wolf. His planning for and organization of courses were meticulous; his presentations in the classroom were logical and thoroughly prepared; the relevance of his examinations and the fairness of his grading were impeccable; and the amount of time he spent in consultation with students is legendary. Whenever there were conflicting demands on Wolf's time, his students came first.

Wolf was a member of Phi Beta Kappa and Beta Gamma Sigma. He died on July 18, 1980. He was a delightful colleague whose dry sense of humor, friendliness, and stellar human qualities will be greatly missed.

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Metropolitan Area Forecast for the 1980's

by William F. Fox

Although the national, state, and metropolitan area economies are interrelated, each responds somewhat differently to changes in the economic climate. In some aspects, Tennessee and its metropolitan areas will differ from national economic trends in the coming decade, whereas in others, the state follows the nation.

Using the Tennessee Econometric Model and the Wharton Annual and Industry Forecasting Model, researchers at the Center for Business and Economic Research (The University of Tennessee, Knoxville) forecast that the current recession will end during 1980, with a small rebound following in 1981. Then, between 1982 and 1988, a moderate economic growth trend should follow. But many factors must be examined for a clear comprehension of the entire picture.

Continuing rapid increases in oil prices are one of the major determinants of the current economic picture. The anticipated average price of one barrel of imported oil in 1980 is $30.20; this is 55 percent higher than the $19.43 price in 1979. The average price of imported oil is assumed to rise by over 14 percent in 1981 and another 13 percent in 1982. Rising oil prices can be expected to hamper the effort to control inflation and recession as the cost of producing goods increases and the cost of gasoline rises.

One determinant of the economic picture which gives reason for optimism is labor force growth trends during the 1980's. The labor force has grown at an average 2.2 percent annual rate since 1963 as the participation rate of women has increased and the children produced by the baby boom have grown up. The women and young people entering the labor force have generally been less experienced than the existing labor force and therefore have been less productive. With fewer ties to seniority, they have also changed jobs more often, so these groups have exhibited higher unemployment rates. These characteristics of the growing labor force indicate that some apparent economic difficulties of the past decade, such as rising unemployment rates and falling productivity, have been partially the result of demographics rather than economics. Reduced fertility rates in the past and slower growth in the female participation rate in the future suggest that the labor force will grow more slowly in the future--about 1.2 percent annually over the decade. Thus, the labor force of the 1980's will be more experienced and more productive and will exhibit declining unemployment rates as it matures.

Low Business Investment

Low business investment during the 1970's has been cited as a major cause of stagflation. Real nonresident investment was 8.6 percent of gross national product (GNP) between 1966 and 1973 and only 7.9 percent between 1974 and 1979. Further, much investment in the past decade went for items whose productivity is not reflected in GNP, such as pollution control equipment. Causes of the low levels of investment included: (1) relative reductions in the cost of U.S. labor; (2) a shift in the economy toward less capital-intensive, service industries; (3) high inflation rates; (4) high interest rates; and (5) rising energy costs.

Trends for the 1980's suggest relatively higher investment. Major causes of this new pattern are greater dominance of technology-intensive industries, reduced federal regulation, and anticipated tax incentives for investment. This will help create a more productive U.S. economy in the 1980's.

The above factors have led to a decline in the rate of productivity growth, one of the significant causes of stagflation in the U.S. economy. The decline in productivity growth was from the 3.2 percent average annual rate of 1947 to 1966 to the 0.8 percent from 1973 to 1979. Manufacturing productivity growth of 0.3 percent is forecast for 1980. Per worker real income can grow only when productivity increases. Stated alternatively, noninflationary wage increases can be given only to the extent that productivity growth occurs. Thus U.S. workers accustomed to rising real income received few real income gains in the 1970's, and most wage increases were inflationary. Productivity growth during the 1980's can be expected to do better, perhaps a little lower than the 1966-1973 rate, as a result of higher investment, a more skilled labor force, and lower regulatory costs. This will provide a stable supply-side stimulus to the economy.

Savings Rate

A final noteworthy trend is the savings rate. The consumer savings rate declined from 7.7 percent in 1975 to

4.9 percent in 1978, meaning consumption demand has been very high. The average savings rate for 1976-78 was 5.2 percent, compared with an average annual rate of 6.6 percent since 1965. Rising housing values which have made homeowners feel wealthier and easy availability of credit were chief causes. For now, at least, this pattern appears to be reversing as consumer credit is declining, and preliminary evidence suggests the savings rate is rising. This means reduced inflationary demand pressures but slower retail sales growth and the resultant consequences for U.S. industry and consumption taxes. It also means a greater portion of GNP will be available for investment.

Tennessee Sensitivity to Recessions

Tennessee is an open economy and must be analyzed within the context of the nation's economy. But Tennessee should not be expected to mirror the national business cycles. Sensitivity to national cycles is a function of the interdependencies between Tennessee and the nation and the type of outputs produced in Tennessee. Examination of the relationship between unemployment rates shows that Tennessee generally had lower rates than the nation but exhibited similar responses to cycles. Historically, Tennessee has been relatively insulated from national economic cycles. From 1948 to 1973 (including five business cycles) the growth rate in nonfarm payroll income in Tennessee was 7.3 percent higher during expansions than during recessions. The cyclical swing in the United States was higher, at 7.8 percent. Evidence indicates now that Tennessee is relatively sensitive to business cycles, as seen by the 6.2 percent cyclical swing in nonfarm payroll growth rates in Tennessee during the 1973-79 period, compared with a 4.1 percent difference for the nation.[1] The most apparent reason is the rapid expansion of manufacturing employment in Tennessee, particularly in durable goods industries. The statewide growth in both durable goods and nondurable goods manufacturing employment exceeds the national growth rate, such that Tennessee employment in manufacturing is growing as a share of the national employment in manufacturing. Durable goods employment has grown at an average annual rate of 4.2 percent since 1960, compared to 1.5 percent for the nation. Tennessee nondurable goods employment has grown 2.1 percent annually compared with 0.6 percent annually for the nation over the same time period. This trend indicates that in the future Tennessee can expect more pronounced business cycles than the nation as a whole.

1980 Recession

The state forecast is prepared using the Tennessee Econometric Model. The short-term forecast is very pessimistic, as the economy is currently in the midst of what may be the second worst recession of the post-war period. The long-anticipated recession is substantially a result of sagging demand. High interest rates brought on by the Federal Reserve's effort to contain inflation have depressed demand for investment goods by businesses and durable goods by consumers. Stricter consumer credit and a desire to save more have reduced other consumption categories as well. Lower consumption depresses production because firms' inventories begin to increase, causing the firms to cut production. The decline in productivity growth provides a supply-side slowdown that further aggravates the recession.

Aggregate statistics of the forecast are presented in Table 1. The current recession is expected to cause a 1.2 percent decline in real gross state product during 1980. This compares favorably with the 4.3 percent decline in output that occurred in 1975 during the 1973-75 recession but is noticeably worse than the 1969-1970 recession, when output in Tennessee did not decline. Manufacturing will decline significantly and durable goods manufacturing industries will be the most severely depressed by the recession. Every durable goods manufacturing industry will decline, with fabricated metals, electrical machinery, and transportation equipment being affected most. Most nondurable goods manufacturing industries will also decline, with rubber and plastics and chemicals being most affected.

The construction sector will be severely depressed by the current recession. A decline in real construction output of more than 3 percent is anticipated. Although relatively strong government construction is limiting the decline, high interest rates during the first half of 1980 have exaggerated a sensitivity to recessions, causing the decline in construction output to be particularly pronounced.

This recession, being strongly demand-determined, may hit nonmanufacturing sectors unusually hard. Trade; services; and finance, insurance, and real estate (FIRE) economic sectors will experience declines during the current recession. Spreading of the recession into these other industries will result from the sharp declines in the trend of consumer purchases as consumer savings begin to rise, consumer credit declines, and real personal income declines.

Some statistics from one national forecast are shown in Table 1. In this case a 0.13 percent *increase* in gross national product is forecast. This is obviously over-optimistic and reveals the importance of careful evaluation of national predictions before a Tennessee forecast can be prepared. Other aspects of the forecast are equally over-optimistic. The more than 3 percent annual growth from 1982-88 is higher than can be expected reasonably. An annual growth rate of approximately 2.5 percent is much more likely. One reason for the high forecast growth rate in GNP is the rapid growth in productivity (U.S. manufacturing output/employee) forecast for the same time period. Based on the historical productivity trends shown above and the likely course for determinants of productivity, a growth rate below 2 percent is likely for the 1980's.

William F. Fox, an Assistant Professor of Finance at The Unversity of Tennessee, Knoxville, and Research Assistant Professor in the UT Center for Business and Economic Research, was formerly an economist with the Economics, Statistics, and Cooperatives Service of the U.S. Department of Agriculture. His special academic interests include public finance and economic development.

Employment Forecasts

The average Tennessee unemployment rate for 1980 is anticipated to be 7.5 percent, after an average 5.8 percent rate in 1979. As an average rate, the 1980 figure is misleading because the low rates at the year's beginning are offsetting the higher rates anticipated later in the year. The monthly unemployment rate can be expected to be above 8.5 percent sometime during 1980.

The rising unemployment rate results mostly from continued growth in the labor force without a corresponding growth in employed persons. The number of nonagricultural jobs will rise very slightly in 1980, with the services and government sectors providing some new positions. Manufacturing and construction employment will exhibit substantial decline.

Output per worker will decline rapidly in some economic sectors. Tennessee manufacturing output per worker declines along with the national trend towards lower productivity (Table 1). Output per worker in services, trade, and FIRE will also decline as the number of workers remains stable or grows while total output declines. Thus, substantial underemployment will develop in these industries. The result in both circumstances will be higher producer costs per unit of output.

TABLE 1

TENNESSEE SELECTED INDICATORS 1979-1988

Description	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Tennessee Gross State Product (Millions of current dollars)	43,540.	46,764.	51,466.	57,717.	64,011.	70,386.	77,243.	84,980.	93,473.	102,349.
Percent Change	9.69	7.41	10.05	12.14	10.91	9.96	9.74	10.02	9.99	9.50
Tennessee Gross State Product (Millions of 1972 dollars)	26,638.9	26,321.1	26,507.0	27,593.5	28,454.4	29,289.3	29,923.6	30,672.3	31,371.7	32,121.4
Percent Change	1.40	-1.19	0.71	4.10	3.12	2.93	2.17	2.50	2.28	2.39
U.S. Gross National Product (Billions of 1972 dollars)	1,431.7	1,433.6	1,445.4	1,495.9	1,544.2	1,593.7	1,633.6	1,685.8	1,736.4	1,789.1
Percent Change	2.32	0.13	0.82	3.49	3.23	3.21	2.50	3.20	3.00	3.03
Tennessee Personal Income (Millions of current dollars)	31,952.	35,055.	38,703.	42,994.	47,552.	52,269.	57,463.	63,432.	70,067.	77,058.
Percent Change	12.01	9.71	10.41	11.09	10.60	9.92	9.94	10.39	10.46	9.98
Tennessee Personal Income (Millions of 1972 dollars)	19,556.6	19,421.0	19,696.3	20,405.2	21,040.7	21,688.5	22,152.1	22,727.2	23,262.7	23,945.9
Percent Change	2.88	-0.74	1.42	3.60	3.11	3.08	2.14	2.60	2.36	2.94
U.S. Personal Income (Billions of 1972 dollars)	1,178.3	1,182.4	1,198.0	1,243.9	1,283.4	1,322.7	1,349.1	1,387.2	1,423.2	1,467.5
Percent Change	2.91	0.35	1.31	3.84	3.17	3.06	2.00	2.83	2.59	3.12
Tennessee Employed Persons (Thousands)	1,864.6	1,874.2	1,883.3	1,911.4	1,938.2	1,965.0	1,987.7	2,010.4	2,033.6	2,057.8
Percent Change	2.73	0.52	0.48	1.49	1.40	1.38	1.16	1.14	1.15	1.19
U.S. Employed Persons (Thousands)	96,947.	97,866.	98,503.	100,055.	101,782.	103,420.	104,717.	106,281.	107,799.	109,223.
Percent Change	2.73	0.95	0.65	1.58	1.73	1.61	1.25	1.49	1.43	1.32
Tennessee Unemployment Rate	5.8	7.5	7.9	7.3	6.8	6.4	6.4	6.1	5.9	5.6
U.S. Unemployment Rate	5.8	6.7	7.4	7.0	6.5	6.1	6.1	5.9	5.8	5.6
Implicit Deflator, GSP	163.4	177.7	194.2	209.2	225.0	240.3	258.1	277.1	298.0	318.6
Percent Change	8.17	8.70	9.28	7.73	7.55	6.82	7.42	7.33	7.54	6.94
Implicit Deflator, GNP	165.5	180.2	197.0	212.5	229.6	246.1	265.3	286.0	309.9	330.9
Percent Change	8.88	8.88	9.32	7.87	8.05	7.19	7.80	7.80	8.04	7.09
Tennessee Manufacturing Output per Employee (Thousands of 1972 dollars)	18.1	17.8	18.0	18.6	19.0	19.3	19.5	19.9	20.2	20.5
Percent Change	-0.31	-1.22	0.88	3.22	2.10	1.70	1.19	1.84	1.57	1.53
U.S. Manufacturing Output per Employee (Thousands of 1972 dollars)	16.6	16.6	17.0	17.4	17.9	18.4	18.8	19.4	19.9	29.5
Percent Change	-1.02	-0.24	2.37	2.74	2.77	2.57	2.25	3.04	2.77	2.88
Tennessee Per Capita Income (Current dollars)	7,296.	7,922.	8,652.	9,518.	10,447.	11,403.	12,448.	13,665.	15,012.	16,428.
Percent Change	10.79	8.59	9.21	10.01	9.77	9.15	9.16	9.78	9.85	9.44
Tennessee Population (Thousands)	4,380.	4,425.	4,473.	4,517.	4,552.	4,584.	4,616.	4,642.	4,668.	4,691.
Percent Change	1.10	1.03	1.10	0.98	0.76	0.71	0.71	0.55	0.56	0.40

Source: Tennessee Econometric Model, Center for Business and Economic Research, College of Business Administration, The University of Tennessee, Knoxville, August 1980.

After the Recession

The nation and Tennessee are forecast to rebound slowly during 1981. The growth rate in gross state product is forecast at under 1 percent. All major industrial sectors are expected to experience positive economic growth except durable goods manufacturing and state and local government. The slow-growth trend will occur because there is no significant demand stimulus in sight for bringing about a strong recovery, something many economists feel is needed if the recovery is to be quick. A large federal tax cut would be one way to create this stimulus, though a tax cut must be applied cautiously to avoid greater inflationary pressures.

Though the recession will be ending during the fourth quarter of 1980, the average unemployment rate will be higher in 1981. This is not an unexpected happening as, historically, unemployment rates continue to rise after a recession ends. Unemployment rates follow this pattern because, even though the labor force is continuing to grow, production is initially stepped up by lengthening work weeks rather than hiring more laborers. The high unemployment rate forecast for 1981 also reflects the slow rebound anticipated after this recession.

Strong economic growth is forecast for 1982, with real gross state product increasing over 4 percent. Growth above the 1980's average is forecast for nearly every sector, but the rebound will be most strongly reflected in those economic sectors which experienced large declines in 1980-81. Construction will experience the largest growth as pent-up demand and lower interest rates lead to more than 6 percent growth. Durable goods manufacturing industries will also rebound very well; output in all industries will grow rapidly, with fabricated metal products and electrical machinery doing the best. Nondurable goods industries will be strong performers in 1982. Rubber and plastics and chemicals should do particularly well among the nondurable goods industries.

The forecast for the remainder of the 1980's is optimistic. Output growth averaging above 2.5 percent annually is

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forecast. Unemployment rates will gradually decline as the labor force growth rate declines and the number of people employed grows relatively rapidly.

Tennessee Forecast Relative to the United States

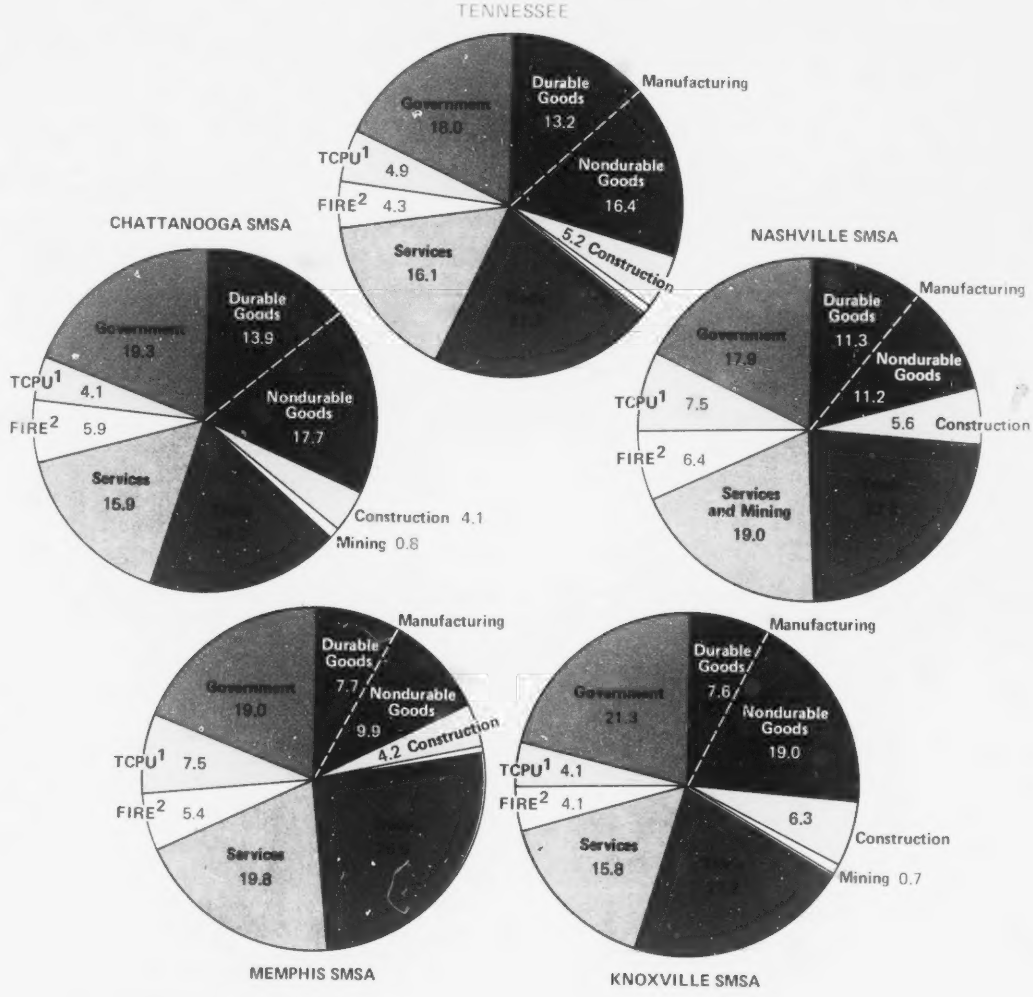
The growth forecast for Tennessee is above our expectation for the U.S. economy as a result of continued expansion of Tennessee manufacturing. Durable goods manufacturing will grow faster the first several years of the decade; then nondurable goods will grow faster during the remainder of the decade.

An important determinant of Tennessee's economic growth will be its ability to remain competitive with alternative business locations. The availability of energy looms as perhaps the most significant location consideration for many firms. If business firms perceive that energy will be unusually tight in the TVA region, slower growth may result in Tennessee.

Inflation

During 1979 the CPI increased by 11.5 percent. Much was said about high inflation rates (18 percent on an annual basis) during the first several months of 1980. These rates did not reflect an underlying inflation trend in the U.S. economy but were the result of rising home mortgage rates which increased the cost of housing and the final effects of large oil price increases which occurred in mid-1979.

Figure 1
Distribution of Nonagricultural Employment in Tennessee and Metropolitan Areas



1. Transportation, Communications, and Public Utilities.
2. Finance, Insurance, and Real Estate.

Source: Tennessee Econometric Model and Metropolitan Area Models, July 29, 1980.

The CPI will grow approximately 14 percent during 1980. The remainder of the forecast period will witness high inflation rates as a reflection of the built-in inflation which exists in the U.S. economy, although it will remain at below 18 percent. Causes of the inflation trend include the rising cost of imported oil; contracts with inflation clauses; low productivity growth; and rising Social Security taxes. Both 1981 and 1982 will have inflation rates above 9 percent. Rates will be lower from 1983-88 but still will average around 8 percent.

Energy sources will exhibit the most rapid price increases. Deregulation of gasoline and natural gas industries will help stimulate this trend. Electric utility prices will also rise quickly as input costs increase.

Metropolitan Areas

Metropolitan area forecasts are prepared using econometric models for the four largest Standard Metropolitan Statistical Areas in Tennessee: Chattanooga, Knoxville, Memphis, and Nashville. The short-term and long-term economic forecasts call for similar overall direction for the economies of each metropolitan area between 1980 and 1988. Though the directions are similar, wide diversity in economic fortunes is expected over the 1980's. Knoxville and Nashville are expected to experience smaller effects from the current recession and to exhibit stronger growth trends over the decade. Chattanooga will be more adversely affected by the recession and will grow more slowly over the decade. Memphis will respond in an average way to the recession and grow below average for the decade.

Comparing percentage growth in real nonagricultural gross product (1972 dollars) Tennessee showed growth of 20.7 percent; Chattanooga, 18.8; Knoxville, 23.0; Memphis, 18.4; and Nashville, 22.9. Growth in nonagricultural jobs was 11.7 for Tennessee; 9.0, Chattanooga; 13.5, Knoxville, 11.6, Memphis; and 14.8, Nashville. Some generalizations on how recessions will affect an area can be made on the basis of employment composition. Government and services employment are relatively insulated from a recession. Durable goods manufacturing is often highly responsive to a downturn; nondurable goods manufacturing is less responsive but exhibits some recession sensitivity. Construction activity, particularly private building, is also responsive to recessions.

Other factors affect the recession sensitivity of an area, so the generalizations are not always valid. Ties with other recession-sensitive industries is another important factor. The textiles industry, generally thought to be relatively stable, produces automobile seatbelts in Knoxville and is therefore responsive to business cycles.

Much of the difference in the response in the SMSA's to this recession can be explained by the different employment compositions. The largest employment categories for Tennessee are manufacturing, trade, government, and services (Figure 1). This is generally true for the metropolitan areas as well, but variation exists in the employment shares and leads to different responses.

Chattanooga is more manufacturing- and government-oriented and less oriented toward construction; trade; and finance, insurance, and real estate (FIRE) than the state (see Figure 1). The unusually heavy concentration of manufacturing is one reason why the Chattanooga economy is forecast to exhibit cyclical behavior. The below-average growth trend in Chattanooga provides no strong stimulus to offset the recession.

It is interesting to note that this responsiveness to cycles has grown since the 1973-75 recession. Unemployment rates in Chattanooga, which have historically been below the state's, never rebounded from the last recession, reached the state's average unemployment rate in 1979, and now exceed the state's. These considerations led to a forecast for a relatively strong business cycle in the SMSA from 1980 to 1982 and a slow growth trend for the 80's decade.

The Knoxville SMSA has a larger concentration of government employment and a smaller concentration of manufacturing employment, particularly in the durable goods sector (Figure 1). This concentration tends to make Knoxville less sensitive to recessions. Other factors favoring Knoxville are a strong underlying growth trend and a large level of nonmarket construction, including the 1982 World's Fair and highway construction. The result is a relatively mild recession in Knoxville and a stronger than average growth trend in the 1980's.

The Memphis SMSA appears to be an anomaly. Significantly below-average manufacturing and construction employment, combined with high levels of government, services, and trade should make the area insensitive to recessions (Figure 1). Yet the SMSA has exhibited relatively large cyclical swings. One reason for the cyclical swings is the below-average growth trend which has provided less support for the economy. Memphis output has grown at only three-fourths of the state's average rate in the 1970's. A recession at the state's average will likely result in the SMSA, and the slow growth trend of the past decade is forecast to continue in the 1980's.

The Nashville SMSA has a relatively large concentration of services; FIRE; transportation, communications, and public utilities (TCPU); and trade. Manufacturing is the sector where Nashville has a relatively low employment concentration (Figure 1). The result is a stable economy which has exhibited a good resiliency during recessions. A strong growth trend has added further strength to the SMSA economy. Nashville is forecast to experience below-average effects from this recession and to grow at an above-average rate during the 1980's.

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1. Howard Friedenberg and Robert Bretzfelder, "Sensitivity of Regional and State Nonfarm Wages and Salaries to National Business Cycles, 1948-79," *Survey of Current Business*, May 1980, pp. 15-27.

This article is taken from *Metropolitan Area Economic Report: Economic Forecasts to 1988 for Tennessee, Chattanooga, Knoxville, Memphis, and Nashville Metropolitan Areas* (Nashville: Tennessee State Planning Office, August 1980). ■

Corporate Management Laws

by Mahlon L. Townsend

The recent celebration of the Bicentennial marked the end of an era that was characterized by the creation and development of an endless list of social, economic, and political institutions, most of which continue to thrive as integral components of contemporary society, and this is especially true of the American business corporation. The time-worn statement that necessity is the mother of invention has never been applied more appropriately than to this legal organization.

The economic explosion commonly known as the Industrial Revolution necessitated large accumulations of land, labor, and capital in order to produce goods at the optimum profit level. Traditional legal organizations such as the sole proprietorship and the common law general partnership soon proved to be inadequate to meet the needs of entrepreneurs, and even the novel attempt to adapt the old common law trust to business operations proved to be unsatisfactory. Consequently, it became obvious that an entirely new form of legal organization would have to be developed in order to secure the continuous succession and limited liability characteristics that entrepreneurs and investors demanded. In other words, such an organization would have

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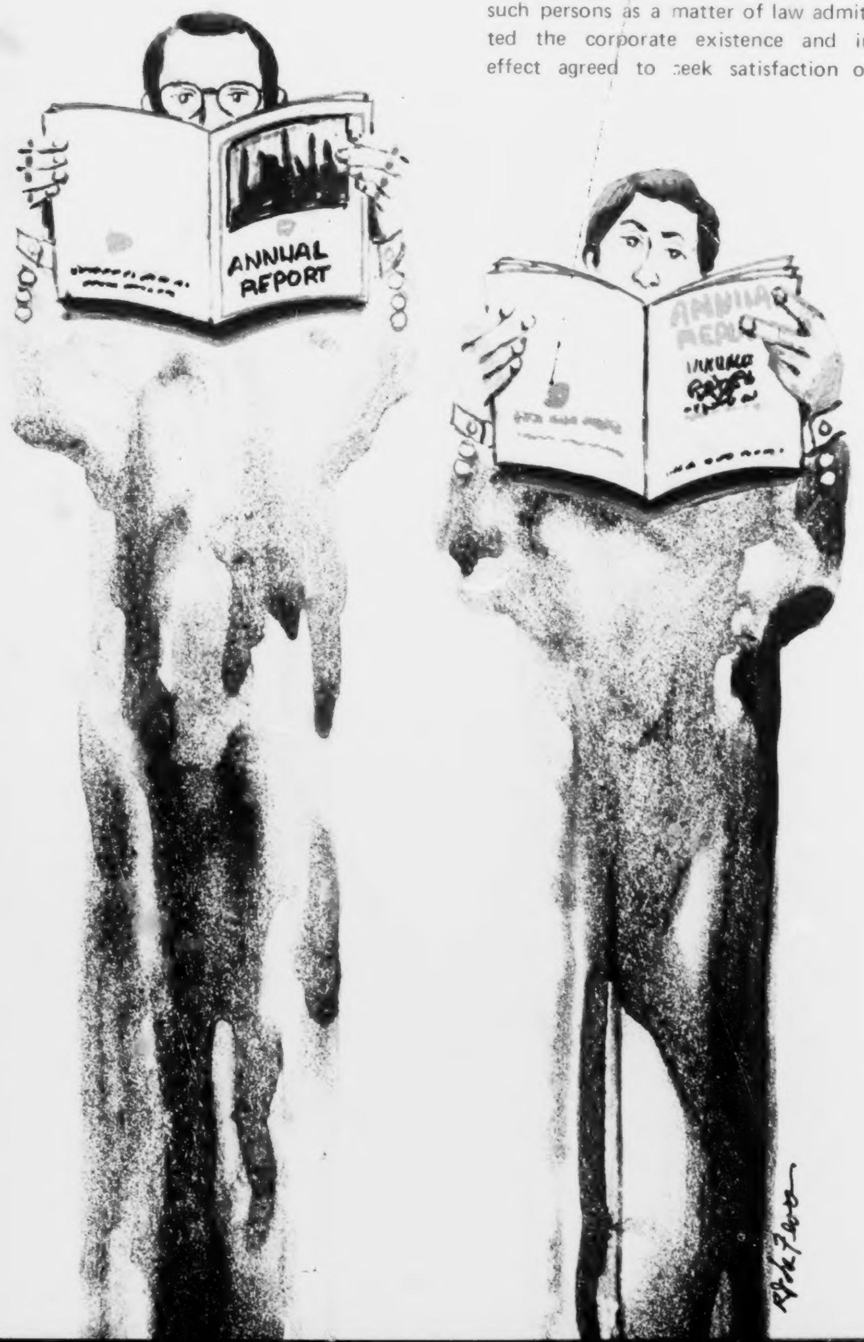
to enjoy an independent existence and be treated as a legal person or an entity.

Conception of the Corporation

The American business corporation thus was conceived and developed primarily as the offspring of a union between two organizations that had existed for a long time in England--namely, the common law joint-stock company and the English governmental or public corporation. Existing only in contemplation of law, this artificial person was granted limited powers to engage in specified business activities for the duration of its charter, with limited liability for its owners and freedom from dissolution upon a change in ownership. Limitation of liability was achieved by the ingenious technique of requiring the firm's owners to contribute and retain intact a specified minimum amount af assets known as capital stock and giving constructive notice to persons who dealt with the firm that it was a corporation so that such persons as a matter of law admitted the corporate existence and in effect agreed to seek satisfaction of their claims only from its assets, and not the estates of its owners.



Realizing that the corporation could function only through its agents and servants and that its owners for numerous reasons should not be permitted to serve as its agents by virtue of their ownership status alone, the creators developed the concept that there should be a separation of ownership and management with the result that the shareholders as such could have no direct managerial powers in the corporation. **However, to be noted shortly, shareholders have always had certain indirect means of controlling the corporation, and to an increasing extent in closely-held corporations, they are exerting more and more direct managerial power.**

Traditional Corporate Management Role

Before an examination of several significant areas of corporate mismanagement and the resultant accountability, brief attention will be given to those persons who in various ways may be involved in management activities. Although state laws and the actual practices followed by various corporations may differ considerably, functional areas of conventional management involve the officers, the directors, and in some situations, the shareholders.

Officers. The minimum corporate offices required by many states, including Tennessee, are those of the president, the secretary, and the treasurer. The Model Act, which is now in effect in most states, but not in Tennessee, provides also for one or more vice-presidents, subject to the by-laws. Depending on its needs, there may be other offices, such as controller, general manager, and chief executive officer. A qualified person normally is permitted to hold dual offices except for those of president and secretary. In many corporations the president is also the chief executive officer, but in other corporations the two offices are separate. Although officers are not required to be shareholders unless the charter so provides, typically, certain officers such as the president and secretary of the board are shareholders. Traditionally, only the directors have the power to employ and discharge the officers, but now shareholders also are being granted this power to an increasing extent.

Although corporate law places top managerial authority in the board of directors, obviously the directors must restrict their activities to making major decision and depend on the officers to implement such decisions. Admittedly, the officers may be immediately answerable to the directors and indirectly to the shareholders, but in the final analysis they are the agents of the corporation and are legally accountable to it. Although it is traditional law that the corporation itself can exercise only those powers conferred on it by applicable statutes and charter provisions, the officers who act as agents are also governed by the law of agency, most of which is still common law.

The officers have the power and the right to bind their corporation by performance within the actual or real scope of their authority, which may be either express or implied. Their express authority normally stems from by-laws, board resolutions, or job descriptions. Implied (or incidental) authority is the actual authority that an officer must exercise in order to accomplish expressly authorized transactions. In corporate situations, questions have sometimes arisen relative to the implied powers an officer can legally exercise solely by virtue of his/her office. In this respect, little or no such implied power is incident to the offices of vice-president, secretary, and treasurer. Traditionally, the president also had no implied power, but in this area the law is changing, and many recent decisions approve such implied power, provided it is exercised in the performance of normal business transactions.

A general manager does have implied power by virtue of the office alone, and if the president is also acting as general manager, this obviously would enlarge the scope of the president's implied powers. Even if an officer acts beyond the scope of his/her actual authority, the corporation may be bound if the elements of apparent authority are present or if the corporation subsequently ratifies the transaction, a step which it can take in any situation in which it could have legally authorized the same.

Shareholders. Classical American legal doctrine has always attempted to distinguish between mere ownership of a corporation and the right to control and manage its affairs. Thus, the oft-repeated statement that shareholders as such have no managerial rights has generally reflected a basic principle of corporation law. Lawmakers and the courts have historically been reluctant to approve any significant amount of such owner management rights for fear that the corporation might become the alter ego of the shareholders and thus open the way for fraudulent manipulation of the corporation's affairs. Additionally, sheer practical considerations also justified this concept, inasmuch as a large and changing body of shareholders obviously could not efficiently manage the business. Until recently corporate law in this respect made little or no attempt to distinguish between public-issue and closely-held corporations, regardless of the number of shareholders. However, in this area there have been several actual and some qualified exceptions to the basic principle, and the principle itself is being eroded to some extent by modern legislation.

Conceding that direct corporate management by the owners may be fraught with substantial risk of personal liability to the business creditors, it has long been a practice for some shareholders to manage their corporations with or without separate officers or directors, especially in small closely-held corporations, even in the face of mandatory statutory or charter provisions that were designed to prevent such action. In some situations such control has continued from the moment of incorporation, while in other cases shareholders have more or less gravitated into control because of the lack of effective opposition. Such dominance often is not challenged as long as business creditors are satisfied and no substantial minority shareholder opposition exists.

Another manner in which shareholders have exerted management control is by serving as directors and/or officers of the business. As noted above (absent a charter provision to the contrary), directors are not required to be shareholders and no law forbids shareholders from also serving in these other capacities, and such is the law in Tennessee. Thus, controlling shareholders who so serve can exercise all the responsibilities attendant to such positions. In fact, the acquisition of a sufficiently large block of shares in a public corporation can pretty well insure the shareholder a board and/or officer position if such is desired. On the other hand, outside candidates for such offices as president and chief executive often are as interested in stock acquisition possibilities as they are in salary and other benefits. In small corporations it is not uncommon for most or all of the voting shares to be represented by owners who occupy all of the managerial positions, while in large corporations the ownership or control of a small fraction of the total shares can assure effective control due to the wide dispersion of the owners of a majority of the shares.

Apart from recognized situations in which shareholders do in fact exert direct managerial control over corporate affairs, they have always enjoyed a substantial amount of indirect control in such matters. For one thing, shareholders traditionally have possessed the inherent power to enact, alter, amend or repeal the by-laws unless this power was vested in in the board of directors by statutory or charter provision. In modern times, statutes such as the Model Act generally give this power to the directors in the absence of a charter

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provision otherwise. Even so, it is still common for statutes to provide for the shareholders to have the residual power to alter, amend, or repeal such director-enacted by-laws, and Tennessee is in accord. Another significant form of control results from the power of the shareholder to elect and remove directors. Obviously, to the extent that such power is exercised to insure the election and retention of those directors whose actions will reflect the management philosophies of the shareholders, this power provides a very important avenue by which the shareholders can exert effective influence on management decisions. Additionally, indirect controls also exist in areas where shareholder approval may be required, such as actions involving a charter amendment, reorganization, mergers, and unusual transactions involving asset acquisition or disposition, and even to dissolution itself.

The sphere of legally recognized shareholder management activity has also been affected in many states by the recent flood of corporate law revision. Apparently, in recognition of the reality of past and present management practices, as well as the desire to facilitate the creation and operation of close corporations, legislatures in several states have made it possible to create corporations without any directors at all. In other states, such as Tennessee, corporations may be required to have no more than one, two, or three directors, depending on the number of shareholders. Even if a small board of directors is mandated, most of its members can be nominal to serve only for the purpose of complying with the law, or such a board could possibly be rendered sterile to a large degree by the employment of a shareholder agreement covering such things as the employment of officers and election of directors.

Additionally, the establishment of a greater-than-normal (usually majority) quorum and/or voting requirements designed to minimize management deadlocks in small corporations can promote more stable and effective direct management activity. As long as the owners function harmoniously and the corporation remains solvent, its external affairs are usually of little or no concern to outsiders. Even irreconcilable disputes that may arise between its owners may be resolved by the implementation of a buy-sell agreement which should exist between the owners of any close corporation. Finally, as noted previously, the statutes of an increasing number of states are now authorizing appropriate charter provisions that expressly permit direct shareholder management.

Directors. Traditionally the board of directors has been the basic core of the entire management structure of the business corporation, at least in theory, if not always in practice. In fact, the statutes of Tennessee and many other states clearly state by appropriate language that the directors are to have this responsibility. Occupying a fiduciary relationship to the corporation, directors enjoy a status which is unique in the legal structure of business, and judges as well as legal scholars have long been prolific in trying to establish the precise relationship that exists between the directors and the shareholders, the corporation and the corporation's employees, especially the officers. Attempting to reconcile the different views existing in this area is somewhat like trying to fit a square peg into a round hole. Cases abound in which it has been stated that the directors were the representatives or agents of the shareholders, and legal writers have also parroted this view. On the other hand, both decisional as well as textbook sources have frequently stated that the directors are the agents of the corporation. Both of these views are generally rejected at the present time, and the consensus is that the directors are not the agents of either the corporation or the shareholders, either individually or as a board.

Although the directors normally function at the top managerial level in respect to making policy decisions, there are some situations in which this is not always the case. As noted previously, modern statutes increasingly give shareholders powers that encroach substantially on the powers formerly exercised exclusively by the directors, such as the power to employ the officers. Also, the several states that permit a corporation to exist without directors obviously make it possible for the shareholders to assume top managerial control, thereby erasing the line that has long existed between corporate ownership on one hand and the right to manage on the other. Further, by the effective use of a shareholder agreement, it may be possible to make the board of directors ineffectual, so that it really cannot function independently. Finally, it is common knowledge that in many large corporations the top officers really make most, if not all, of the management decisions which are routinely approved by the directors, thus relegating such directors to a position where they are expected to "rubber stamp" official decisions.

Deviations from the Norm

Normally, directors can function as such only as a group at a board meeting at which a quorum is present. An individual director has no power to bind the corporation alone by virtue of his/her office, nor can such director bind the corporation by being polled. However, in this area also, an increasing number of states are now permitting deviation from established legal norms. Subject to charter provisions, most states, including Tennessee, now permit the directors as well as the shareholders to vote on official matters by written consent without having a meeting. Also, recently-enacted statutes in several states (also including Tennessee), now permit directors to take official action by communicating via a conference phone arrangement without actually being physically present at a meeting. Even in a situation where the directors are required to give formal approval to a transaction but fail to do so, the corporation may be bound if the majority of the directors indicate by their conduct that they approve of such transaction.

In all situations in which directors are required to act officially, they must act in person, and not by proxy. Consistent with basic fiduciary law to which they are subject, directors are not permitted to abdicate their overall discretionary managerial responsibilities to others. Yet even this basic concept is subject to certain exceptions. For one thing, directors appoint and clothe the officers with powers and responsibilities which, in theory at least, the directors could exercise themselves, but for practical reasons do not. Another form of delegation occurs when the board creates an official committee, such as the executive committee, to act for it. Functioning committees of the board are very common today, although the composition of such committees and the extent of powers which can be delegated to them varies with the state statutes and charter provisions. Tennessee statutes are quite liberal in this respect.

If the directors attempt to delegate all or a significant amount of their total responsibilities to outsiders such as management companies, serious difficulties arise. As a general rule, a delegation of reasonable authority not exceeding that which can be delegated to the officers will be sustained. Not only the amount of such authority but also the duration of such delegation will be crucial factors in determining its legality. Any irrevocable delegation of all or the most important of a board's powers to outsiders for a long period of time almost always will be illegal and void. Also, until recently, the employment of an outsider such as an arbitrator to settle disputes existing between members of a deadlocked board was frowned on by the courts, especially if the deadlock involved a major issue. However, recently-enacted statutes in many states, including Tennessee, now generally permit the appointment of such a person under their provisional director statutes. In any event, the delegation of any of the board's powers makes the recipient liable for their use or misuse to the same extent that the directors would have been liable. Finally, it should be repeated that in a growing number of states, statutes relating primarily to closely-held corporations expressly authorize the assumption of management powers by one or more shareholders, and if shareholders so assume such powers, they will also be liable as directors.

Management Responsibility Standards

Irrespective of who actually discharges the management functions--directors and/or officers and/or controlling shareholders--such managers obviously must be accountable for their conduct. As noted previously, such accountability normally is to the corporation itself, but occasionally it may extend to all the shareholders or a minority of them or even to society itself, as would be the case involving criminal liability. There is a plethora of law and literature in this area and only a legal encyclopedia could adequately cover the entire range of legal possibilities that can be involved. Consequently, only selected areas of management liability will be noted here.

Applicable laws. In earlier days, corporations and their managers were governed primarily by charter provisions and by-laws supplemented to a limited extent by miscellaneous state statutes. Over the years, however, a growing body of legal restrictions has appeared. Not only has decisional law with its characteristic areas of uncertainty been established, but expanding state and federal civil and criminal statutes, as well as a developing body of administrative regulations (especially on the federal level) have created a laundry list of management rights and liabilities.

Business judgment rule. Although there is a lack of uniformity in this area, directors and others who act as directors are expected to perform according to a standard that has become known as the business judgment rule. Such a standard has evolved primarily as a consequence of decisional law, although it is now incorporated in some state statutes, for example, as in the case of Tennessee. Simply stated, corporate managers are required to exercise good faith and due care in discharging their duties. Despite losses that may stem from errors of judgment or mistakes, such managers are not liable for the same, provided they acted in compliance with this standard. However, the standard furnishes no immunity from personal liability for losses caused by intentional or negligent mismanagement, a violation of applicable fiduciary duties, or even for nonintentional losses that may be the consequence of a statutory violation. Consistent with the rule that nondirectors who manage may be subject to director liability, the business judgment rule can also protect such nondirector managers from personal liability, provided their actions conform to the standard.

Areas of Management Liability

If existing law and theoretical possibilities are the criteria, it would be practically impossible to enumerate all of the possible grounds of management liabilities. Consequently, only a limited number of such areas will be noted herein. Not only does decisional law furnish a basis for guidance in this field, but increasing statutory enactments contribute to an expanding scope of such liability.

Ultra vires transactions. Directors, as well as others, may be liable for authorizing and/or engaging in *ultra vires* transactions (transactions outside the authority of a corporation). In some states the liability is strict, while in others it will result only from willful or negligent actions. Although modern statutes which expand the area of corporate powers and authorize broader charter provisions minimize the probabilities of transactions being *ultra vires*, management cannot ignore this area of possible liability.

Violations of fiduciary standards. This continues to be a broad area of possible personal liability for officers, directors, and controlling shareholders. It includes many well defined areas of mismanagement such as (a) engaging in any of the many possible forms of illegal competition with the corporation, (b) engaging in any kind of a transaction that involves a conflict of interest, (c) failing to secure a corporate opportunity whenever such is available or (d) engaging in any of the many forms of illegal activity that will be prejudicial to the interests of minority shareholders. Also, there should be included such actions as the sale of control of a corporation under conditions that will cause great harm to minority shareholders or the corporation itself, such as looting the corporation's financial assets. Along the same line, management's use of corporate funds to issue or acquire the firm's own stock primarily for the purpose of protecting management's control can be illegal. Admittedly, many acts of management are difficult to categorize technically as fiduciary standard violations, but legal scholars have succeeded in identifying a wide range of deviations from norms in corporate management.

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Common law. As it applies to corporations, the common law as a source has limited application because in a technical sense there was no early common law of corporations. Yet 200 years of court decisions have furnished many legal standards that apply to corporation managers, especially in the area of agency law, which significantly affects the liability of officers and others who represent the corporation in a *respondent superior* relationship. In addition, several areas of tort law relative to management are derived from common law principles. Some modern statutes relative to such matters as voting, dividends and distributions, and wasting corporation assets have been enacted either to codify or change common law rules.

Statutes. Both the states and the federal government have been prolific in imposing legal liabilities on directors and other management personnel in recent decades. Not only does the Model Act enumerate certain specific actions which will expose directors to personal liability, but corresponding statutes in nonadoptive states such as Tennessee, do likewise. Usually covered by such statutes are illegal dividends or other distributions of corporate assets, acquisition of its own shares by a corporation, loans to its officers, directors, and shareholders, and liability for incomplete or defective organization. Other statutory constraints on management are sometimes contained in the state's "Blue Sky" laws.

On the federal level, the extent of statutory regulation can be appreciated by the constant volume of civil and criminal litigation that is reported in the mass media. Numerous statutes in the areas of antitrust and trade regulation, as well as tax and bankruptcy statutes, have existed for some time. During the last several years new federal statutes relative to political campaign contributions by corporations and their officials have been enacted. As recently as 1977, Congress enacted the Foreign Corrupt Practices Act for the purpose of outlawing payments made to foreign officials and other specified parties to secure business. Finally, the Securities and Exchange Act of 1934 has been very important to managers of large corporations. Especially important in this respect are Sections 10b-5 and 16 (b). Section 10b-5 covers several areas of possible fraudulent conduct, including inside trading, for which directors and possibly others can be liable. Section 16 (b) regulates short-swing profits by officers, directors, and certain shareholders in corporations subject to the law and requires that such profits acquired illegally be turned over to the corporation.

Conclusion

Even a cursory examination of current laws reveals many of the changes which have occurred in relation to management's rights and liabilities, and other changes are currently being made. Modern statutes clearly indicate a desire on the part of lawmakers to create an atmosphere in which modern management principles can be employed, free from the many shackles of earlier laws. At the same time, new legal restrictions are being imposed on management, especially in large public-issue corporations, for the purpose of protecting not only the shareholders, but also investors, business creditors, and the consuming public.

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A stop watch is used to check production time of a worker at the Levi Strauss plant, where 90% of goods produced are made under a piecework plan.

Wage Incentives and their Effect on Productivity in Tennessee

by S. Kyle Reed

Wage incentives in Tennessee are alive and well! This conclusion is the result of extensive current research involving manufacturing firms throughout the state.

In recent years there has been much concern among industrial engineers and management regarding an apparent decrease in the use of wage incentive systems in the United States. This is of especial concern now that so much emphasis is being placed on the necessity for increased productivity in this country. Since there have been predictions that wage incentive plans are gradually disappearing from the American scene, it is interesting to learn what the situation is in Tennessee.

The current study is probably the most comprehensive ever made into incentive plans and their effect on productivity. Since no previous study had been made specifically concerning the state of Tennessee, efforts for the past year and a half were concentrated on the 4900 firms listed in the 1978 **Tennessee Directory of Manufacturers** published in Nashville by the Tennessee Department of Economic and Community Development.

A random sample of companies included in the directory resulted in 437 replies to an extensive questionnaire. A subsequent random sample of those companies having wage incentive plans prompted visits to concerns in all parts of the state in order to include as many types of industries as possible and to assure the inclusion of small, medium, and large companies--from those with fewer than 50 employees to those with more than 2500. The in-plant visits were for the purpose of getting a better feel for the success of different types of incentive plans and their effect on productivity.

Definition

For purposes of this study, a wage incentive plan refers to an agreed-upon financial reward which prompts an employee to act so as to achieve and surpass a specified goal or standard set by management. There are many types of incentive plans, ranging from a simple, individual piece-rate plan to a plant-wide system which might cover all employees, including management personnel. However, emphasis in this study concentrates on individual and small group plans.

Two of the best studies concerning the use of wage incentives in American industry were made in 1959[1] and 1977[2]. Although the 1959 study found that 51 percent of the respondents had wage incentive applications, by 1977 this number had decreased to 44 percent. Some comparisons will be made between those studies and the current one; however, since the number of respondents from manufacturing concerns in the 1977 study was only 275, the sample is considered too small for many meaningful comparisons.

As compared to the above figures for the United States as a whole, 30.4 percent of the responding companies in the state of Tennessee had wage incentive applications. Table 1 shows a breakdown of those companies by Standard Industrial Classification. Of the companies which indicated they did not presently have a wage incentive plan, 31 companies (more than 10 percent) indicated that they plan to develop one in the near future.

TABLE 1

WAGE INCENTIVES IN TENNESSEE

Industry by SIC*	Number of Companies Responding	Number Using Incentives	Percent of Companies on Incentive
Food and Kindred Products	27	4	14.8
Textile Mill Products	17	11	64.7
Apparel and Other Finished Products Made from Fabrics and Similar Materials	40	33	82.5
Lumber and Wood Products (except Furniture)	36	13	36.1
Furniture and Fixtures	20	9	45.0
Paper and Allied Products	18	2	11.1
Printing, Publishing and Allied Industries	28	5	17.9
Chemical and Allied Products	25	5	20.0
Products of Petroleum and Coal	1	0	--
Rubber and Plastic Products	22	6	27.3
Leather and Leather Products	6	5	83.3
Stone, Clay, and Glass Products	25	4	16.0
Primary Metal Industries	21	7	33.3
Fabricated Metal Products	46	5	10.9
Machinery (except Electrical)	35	7	20.0
Electrical Machinery, Electronics and Allied Industries	24	7	29.2
Transportation Equipment	18	4	22.2
Professional, Scientific, and Controlling Instruments, Photographic and Optical Goods; Watches and Clocks	10	1	10.0
Jewlery, Silverware, and Related Items; Other Miscellaneous Industries	18	5	27.8
TOTAL	437	133	30.4

Source: Table constructed by author.
*Standard Industrial Classification

Company Size and Incentives

There seems to be some relationship between the number of employees and wage incentive application. In Table 2 is a breakdown of the number of employees in the responding companies and the percentage of those using wage incentive plans by size of the company.

Those companies with fewer than 100 employees generally think that it is not economical to maintain an industrial engineering function adequate to install or maintain a system. Of the companies without incentive plans in the category employing fewer than 100, 54.2 percent thought the work was uneconomical to measure, and 51.8 percent said that the work was not conducive to measurement. These conclusions seem unlikely, since 16 percent of these companies, for example, are in the fabricated metals classification, where work measurement has been easily applied for many years. In fact, the 1959 study found that 75 percent of the responding companies in this classification used accepted work measurement techniques.[3]

Unionization and Wage Incentives

Unionization seems to have no effect on whether or not an incentive plan is used. In fact, there was little mention of unionization opposition during the study. Of the sample size included in the survey (437), 168 companies (38.4 percent) were unionized, and 269 (61.6 percent) were not. Of only those companies with wage incentive plans, essentially the same percentage difference was demonstrated. Companies which were unionized numbered 45, or 33.8 percent; and those which were not unionized numbered 88, or 66.2 percent (a total sample of 133).

Most companies indicated that they received complete cooperation from the union regarding the administration of the wage incentive plans. In fact, there were cases in which the union encouraged even more complete coverage.

Union contract agreements can become somewhat cumbersome when wage incentive plans are involved. One company, for example, has a contract which requires 77 pages to cover all aspects of wage payment provisions, many having to do specifically with the setting of standards and the administration of the wage incentive plan.

Coverage of Indirect Employees

Only 18 percent of the companies having incentive plans cover any of their indirect workers, such as maintenance, materials handling, and set-up personnel. On the other hand, one company visited has all indirect workers covered by a very unique plan based on improvement over past performance. The company reports that these workers have achieved a 200 percent performance as compared to the base period used to set the standard of performance.

Types of Plans Used

When companies were asked the type of incentive plan they employed, many different systems were mentioned, but almost 85 percent of the companies used traditional methods. In a sample of 133 companies, 66 (or 50 percent) used a piecework type incentive plan; 45 (34 percent) used a standard hour or measured day work plan; and 36 (27 percent) used plant-wide or other types of plans. (Numbers will not total to 133, since some companies used more than one type of system).

Piecework is the most common type of plan. This system simply pays an employee a certain amount of money per piece, per dozen pieces, per 1000 pieces, etc. Although piecework started in the needle trades and is still primarily used there, it can be used in other types of work as well.

The Standard Hour Plan is similar to piecework in many ways. The essential difference is that under this method, standards are established in terms of time per unit or number of units. At the end of a work period the employees can add up the total time accumulated during the period and compare it with the actual time elapsed in order to determine his efficiency during the period. For example, if through time study or some other system of measurement a standard is set at one hour per unit of work, this means that in an eight-hour day, the standard has established a "fair day's work" as the production of eight items. At the end of an eight-hour day, if the operator has produced ten of the items, he has produced 25 percent more than a "fair day's work." Therefore, his efficiency is 125 percent. Most standard hour systems will pay a one percent bonus for every one percent increase in efficiency above 100 percent ("a fair day's work"). This means that the operator who has worked at an efficiency of 125 percent will receive 125 percent of his base pay for eight hours worked. There are other ways of expressing standards and efficiencies under this method, but our illustration is the most often used.

Measured Day Work can be used for either incentive or nonincentive purposes. For the incentive aspect, however, work is measured with a stop watch or other measurement technique, and efficiencies of employees are figured over longer periods of time than in most other wage incentive systems. For example, one company in the study had a great deal of difficulty in setting standards on the work in one department which traditionally had been paid on a straight time basis. Because of the variances in the work from day to day and hour to hour, efficiencies are averaged over a three-month period. For the following three months, the employee receives an hourly rate which reflects this three-month efficiency. During each subsequent three-month period efficiencies are averaged for determining pay for the next three months.

There are many other unit-wide and plant-wide systems being used today. One good example is the Scanlon Plan, which is an employee participation plan for the improvement of productivity.[4]

Individual and Group Plans

In general, the most effective plans are individual incentive plans, where standards of performance are set for each specific job and employees work as individuals against that standard. Then incentive pay is calculated on an individual basis. However, there are many group plans, ranging from groups of two or three to a whole department or an entire plant.

In Tennessee, the percentage of companies using the individual and group plans can be broken down as follows: group plan, 12.2 percent; individual plan, 63.4 percent; plant-wide plan, 13.0 percent; and some combination of the above, 11.4 percent.

Standards of Performance

Time study with a stop watch is still by far the most widely used method for setting standards, even though other methods are quite popular, as reflected

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in Table 3.

The difference between standard data and predetermined time systems is that standard data include data that the company has collected as a result of work measurement over a long period of time, while a predetermined time system is one of the commercially marketed standard data systems such as Methods-Time Measurement (MTM), a system originated by the Maynard Research Council in Pittsburgh. About 33 percent of the companies use their own standard data, while about 19 percent use the MTM-type system.

The proper maintenance of standards of performance has long been one of the biggest problems with an incentive system. If such standards are not constantly policed they can allow inequities which can easily wreck the whole system. When asked how often standards were audited, 35 percent of the companies said once per year, and about 17 percent, twice per year. The remainder of the companies take a look when there is a change in material, equipment, or method, and as the industrial engineering department can work it into the schedule of audits.

Average Incentive Earnings

Thirty-five percent of the companies using incentive plans reported that covered employees received bonus payments averaging between 15 percent and 25 percent of their base pay. Earnings in a number of companies were more than 55 percent above base pay, as indicated by Table 4. The average increase for all companies was reported as 25.1 percent. This compares quite favorably with the 28 percent increase reported in the nationwide survey of 1959.

Wage Incentives and Productivity

News of the decreases in productivity of American workers in recent years has been of nationwide concern. Even though our output per worker (productivity) is still the highest in the world, other countries are rapidly catching up with us. This fact was clearly demonstrated in the June 24 NBC White Paper entitled **If Japan Can, Why Can't We?**

Feelings expressed by executives of all the companies interviewed in this study seem to indicate that wage incentive plans could play a big part in increasing the productivity in this country. Almost 13 percent of the companies report increases of more than 55 percent as a result of the wage incentive plan; and one company in particular which had recently installed an incentive plan in a traditional timework department showed records to prove that productivity in that department had more than doubled.

There is no question that money is the biggest motivator to higher productivity among hourly paid employees--and perhaps all other employees as well. Psychologists have long minimized this idea, saying that such things as participation, self-expression and job enrichment are the real answers to our problems.

The concept of financial reward as motivation has been confirmed by an extensive study made recently by Edwin A. Locke of the University of Maryland.[5] Locke examined all experimental field literature for studies involving four methods of motivating employee performance. These methods of motivation are money, goal setting, participation, and job enrichment.

Money as a motivator is discussed in relation to a wage incentive plan wherein money is paid to an employee for surpassing a standard of performance, an idea originated by Frederick Taylor around the turn of the century. Locke says that the importance of money as a motivator has been "consistently downgraded by most social scientists, industrial sociologists, and advocates of human relations."

Goal setting is identified as a system similar to MBO (Management by Objective) systems, involving the setting of targets and performance by the worker and his superior.

Participation in decision making includes all studies involving worker-management participation programs through work committees and joint decision-making meetings.

Job enrichment is the recent development which advocates the rearrangement of jobs to result in greater variety on the job, making it less monotonous and boring.

Comparing these four motivational techniques, Locke found that the four incentives produced the following median productivity improvement: money, 30 percent (in individual piece-rate studies only); goal setting, 16 percent; participation, 0.5 percent; and job enrichment, 8.75 percent.

The results of Locke's study are included not to downgrade the importance of the other methods of motivation, because many companies have used them with a great deal of success, but to prove that money as a motivator has long been neglected in efforts to increase productivity of workers.

It is difficult to determine the exact effect that the incentive system alone has on productivity and how much might be the result of other things such as methods study, work measurement, and better planning of the work which is required under an incentive system. Results of the research conclude that if we look at a job for which a standard of performance has never been set, the mere fact that the job has now been studied and a standard established might increase the efficiency as much as 40 percent.

Most industrial engineers agree that without standards of performance, management is lucky to receive more than 70 percent efficiency from the worker. If the job is studied and a standard is set, efficiency can be increased to as much as 100 percent, but usually the only way to obtain an efficiency of more than 100 percent is with the installation of a wage incentive plan of some kind.

One Tennessee plant manager mentioned that his company recently also opened a new plant in New Jersey. The plant has been fully staffed for almost a year, and good training programs exist at the new location. All operations are the same--with the same machinery and equipment, the same methods, the same materials, and the same training. Because of opposition, no incentive plan has been installed at the new location, and productivity is less than 70 percent of that at the Tennessee plant, which does have an incentive plan.

The Recession and Wage Incentives

Since the field research was done during a period of recession, the researcher was interested in finding out to what extent a decrease in the demand for a product would influence the worker to try to stretch out the work if a layoff became imminent. "Stretching out" is a term meaning to unnecessarily prolong the job at hand in order to prevent layoffs from lack of work. In only one company, one which produces primarily for the automotive industry, was there an obvious effect. A company executive explained that as the result of three layoffs in recent months, the average efficiency of the workers on incentive had decreased from an average 150 percent down to 100 percent.

Other than this example, no other company had noticed a significant "stretching out" of the work. In fact, one company had had a rare experience: the work week was cut back from five days to four days, and some of the employees increased their efficiency to the degree that they were earning almost as much in four days as they would ordinarily have earned in five.

According to one executive, when it comes to layoffs, it is every man for himself. Employees are usually laid off according to the seniority system (with newest employees being laid off first) and the older employees will not stretch the work to save the jobs of newer employees.

Secrecy of Earnings

Normally it is felt that if an employee knows how well he is doing as compared to other employees, it will serve as a motivating factor. But the extent to which incentive earnings are made public varies tremendously. In one company it was found that employees insisted that incentive earnings be treated as highly confidential information, with only the individual and the immediate supervisor knowing how much an employee earned. But in most cases, this information is highly publicized. In fact, in one company employees strive for recognition through the posting of efficiencies in the cafeteria of the plant. Employees are recognized in four categories. If they reach 100 percent efficiency, their picture appears on the Green Board; when they reach 110 percent it appears on the Red Board; 120 percent puts them on the Blue Board; and when they surpass 130 percent efficiency their picture appears on the President's Club Board.

Incentive vs. Non-Incentive Workers

When instituting wage incentive plans, a company should cover as many employees as possible, but in many cases companies do not see fit to include some workers, especially indirect workers, in the program. Although in almost every company where this situation exists, management makes it a point to allow nonincentive job workers to transfer to incentive jobs if they so desire, some workers are just not interested in putting forth extra effort and would prefer to be paid strictly on an hourly rate basis.

Problems with Incentive Plans

Those who have worked with wage incentive plans would be remiss if they did not admit that there are many problems connected with the installation and maintenance of such plans. Human relations problems can result from poor standards (which result in inequities), a lack of understanding of what the system is to accomplish, a lack of understanding of the system itself, the failure of an employee to meet standards where such failure is beyond the control of the employee, and the changing of a standard if there is not a clear understanding as to why the standard is changed.[6]

Despite all the problems that can arise, only 5.0 percent of the companies participating in the study indicated any problems whatsoever. They were asked specifically, "Has your company encountered adverse employee reactions to the use of its wage incentive plan?" The most prevalent comment was to the effect that productive employees like it, but poor workers are not happy with it. During the plant visits, only one criticism was expressed. That had to do with inaccurate counts on the part of the employees.

Conclusion

Wage incentives are not a panacea which will make all productivity problems disappear from the scene, but since almost 70 percent of the manufacturing firms in Tennessee do not use such plans, it might be worth their while to give wage incentives some consideration.

One company executive had this comment to make concerning the increased productivity resulting from his firm's wage incentive plan: "I now operate the plant with only one shift. If it were not for the incentive plan, I would have to operate three shifts with the same number of employees on *each* shift that I now have on one in order to produce the same volume of product. There is no doubt about it, the plan is the answer to my productivity problem."

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1. "The Truth About Wage Incentives and Work Measurement Today," *Factory*, April 1959, p. 74.
2. Robert S. Rice, "Survey of Work Measurement and Wage Incentives," *Industrial Engineering*, July 1977, p. 18.
3. "The Truth About Wage Incentives and Work Measurement Today," *Factory*, April 1959, p. 74.
4. See, for example, *The Scanlon Way to Improved Productivity* (Athens, Tennessee: Electrical Products Division, Midland-Ross Corporation, 1979.)
5. Edwin A. Locke, *et al.*, "The Effectiveness of Four Methods of Motivating Employee Performance," an unpublished paper presented in Thessaloniki, Greece, August 1979, and repeated at a Colloquium at The University of Tennessee, Knoxville, on February 8, 1980.
6. For further discussion of these and other problems see *Wage and Salary Administration* by David W. Belcher, Prentice-Hall, 1962, and the current edition of this text, *Compensation Administration*, 1974. ■

TABLE 2

PLANTS USING WAGE INCENTIVE PLANS

Plant Size (by Total Number of Employees)	Number of Plants Responding	Number Having Incentive Plans	Percentage with Incentives
Up to 99	201	46	22.9
100-249	122	39	31.9
250-499	55	25	45.5
500-999	36	16	44.4
Over 1,000	23	7	30.4
TOTAL N	437	133	--

N = Designates size of the sample.

TABLE 3

METHODS OF SETTING STANDARDS FOR PERFORMANCE

Method	Number of Companies	Percent of Total Companies
Time Study with Stop Watch	92	70.2
Standard Data and Predetermined Time Systems	69	52.6
Historical Data	43	32.8
Work Sampling	25	19.1
Other Methods*	10	7.6
TOTAL N **	131	--

*The "Other Methods" category includes such things as tons of output and profits of the company.

**Number of companies and percentages will not add to the total because many companies use more than one method. For example, seven companies indicated that they use each of the top four methods.

TABLE 4

AVERAGE INCREASE IN EARNINGS UNDER WAGE INCENTIVE PLANS

Average Increase Above Base Pay (In Percent)	Number of Companies	Percent of Total Companies
Up to 5	3	2.3
5-15	32	24.6
15-25	46	35.4
25-35	22	16.9
35-45	8	6.2
45-55	8	6.2
Over 55	11	8.5
TOTAL N	130	--

Source: Tables constructed by author.

Impact of Replacement Cost Data on Financial Statement Analysis

by Edward B. Grant

and

Thomas R. Weirich

One of the most significant and vigorously debated reporting issues in the financial world concerns the recent replacement cost disclosures required by the Securities and Exchange Commission (SEC). The issuance of Accounting Series Release (ASR) No. 190 by the SEC in March 1976 requires certain major corporations to disclose to third parties selective replacement cost information concerning an entity's productive facilities, depreciation, inventory, and cost of sales for fiscal years ending on or after December 25, 1976. The disclosure of this selective replacement cost data is required for all SEC registrants meeting certain size requirements.

Although a multitude of articles have presented the "how to" of replacement cost data generation and disclosure, in addition to the limitation of the disclosed data, few studies have investigated the effects of the presently disclosed replacement cost data, particularly in financial ratio analysis. Therefore, the primary objective of this article is to provide additional empirical evidence as to the impact that the current SEC replacement cost disclosure requirements have on selected financial profitability (performance) and activity ratios of 155 corporations. The study examines the question, if replacement cost data were employed in ratio analysis, what would be some of the statistical or distributional characteristics of replacement cost-generated ratios as compared to those ratios computed using traditional historical costs?

Impact of Changing Price Levels

The primary impetus for the issuance of ASR No. 190 by the SEC had been the resurgence of inflation which recently has reached double-digit levels. As a result, it is apparent that information for decision making concerning current costs of operating a business cannot be fully obtained from the typical historical cost financial statements.

Effects of changing prices are often reflected earlier in particular financial statement items than in other statement items. For example, the effect of price changes for inventory is recognized in the sales price of a product or service (in the form of a higher selling price) earlier than in the cost figures of most fixed assets on the financial statements. This delayed recognition for fixed assets is a result of the longer replacement cycle for this type of asset. Stated differently, increases in price are not recognized for fixed assets until the item is replaced, which may be several years into the future. This distortion results in a violation of what Revsine terms "dimensional soundness."[1] This fundamental requirement, which should be observed in the calculation of any financial ratio, is identified by Revsine as follows:

> Dimensional soundness means that the units in which the numerator and denominator are stated to be such that, after division, the quotient has an unequivocal and meaningful interpretation.[2]

A cursory review of the components of many financial ratios indicates that such ratios, when computed using historical cost data, are not dimensionally sound. Some ratios have the numerator stated in current dollars with the denominator stated in historical dollars, while other ratios have the reverse situation. Thus, from the viewpoint of a financial ratio user, it appears paramount that the user be made aware of the distortion changing prices may have on specific financial ratios generated by historical cost accounting procedures.

Sample Selection

Approximately 1000 companies were originally affected by the issuance of ASR No. 190 in the reporting of replacement cost data. Of these, 250 registrants affected by the replacement cost disclosure requirement for the year 1976 were selected for this study. An emphasis was made in the selection of firms to obtain a wide range of firms in various industrial classifications. Thus the study is limited to a general cross-sectional analysis of firms and does not attempt to compare individual firms and/or specific industries.

Since many annual reports disclosed only limited information as to the impact of replacement cost data, it was necessary to obtain the 10-K report from each selected registrant. A total of 250 Form 10-K's were requested from the initial 1000 firms, of which 203 firms responded. From the reports received, 48 were eliminated due to incomplete replacement cost data. As a result, the final sample consisted of 155 firms. The industrial classification was as follows: Aerospace, 1; Automotive, 9; Beverages, 1; Building material, 12; Business equipment, 4; Chemical, 16; Construction, 2; Cosmetic and soap, 4; Drugs and hospital supply, 7; Electrical equipment, 4; Electronics, 4; Food, 8; Machinery and machine tools, 14; Metals and mining, 9; Oil, 18; Photographic, 7; Printing and publishing, 3; Public utilities, 8; Retail merchandising, 3; Steel, 8; Textile, 3; Tire and rubber, 2; Conglomerate and miscellaneous companies, 8; total sample, 155.

Impact of ASR No. 190

Four important management performance and activity ratios were selected for analysis in this study: profit margin, return on total assets, inventory turnover, and asset turnover. In percentage change results in individual ratio components, when comparing historical costs components with the components adjusted for ASR No. 190 requirements, inventory increased 19.2 percent and net fixed assets 66.2 percent when adjusted for replacement cost data. Many firms report cost of sales at values approximating replacement costs, thus yielding a lower percentage change when adjusted for replacement cost. In an examination of percent increase in ratio components when using replacement costs, two firms reported a decrease in ending inventory; one firm reported a decrease in net fixed assets; twelve firms reported a decrease in cost of sales using replacement costs; and two firms reported a decrease in depreciation expense using replacement costs.

Impact on Ratio Analysis

Before considering the observed results, it is important to understand the notion of replacement cost income. While operating revenues are recognized in the same manner under either historical costing or replacement costing, this similarity does not generally hold true for other determinants of income. Under replacement costing, the cost of sales represents the replacement cost of sold goods at the sales date. Furthermore, the depreciation and amortization of tangible operating assets reflect the generally higher replacement costs of the related long-term assets as of the end of the year. Thus, to this extent, it would seem that replacement cost income would be lower than historical cost income.

Conceptually, however, it is widely accepted that the computation of replacement cost income should include so-called "holding gains." The holding gains result from holding tangible assets during periods in which replacement costs increase. In addition, holding gains are typically dichotomized into "realized" and "unrealized" portions. Realized holding gains represent increases in the replacement cost of tangible assets which are disposed of or which partially expire during the year. The unrealized portion results from increases in the replacement costs of tangible assets which are still on hand at year-end. A brief example may prove useful to illustrate conceptually the computation of replacement cost income.

Assume that we buy and sell widgets. At the start of the first year of operations we purchase one widget for $10. We hold this item for the first six months and then sell it for $20. On the date of sale, we purchase a second widget for $15 (the replacement cost) and hold it for the remainder of the year. There are no further sales or other expenses during this time, and by year-end the replacement cost of the widget has increased to $18.

The computation of replacement cost income from the above example would be as follows: Sales, $20 minus Cost of Sales, 15 = Operating Income, $5, + Realized Holding Gain, 5, + Unrealized Holding Gain, 3 = Net Income, $13.

The cost of sales represents the replacement cost of the widget at the date of sale. The realized holding gain reflects the increase in the replacement cost of this widget prior to the sale ($15-$10). The unrealized holding gain pertains to the increase in the replacement cost for the second widget, which is still on hand at year-end ($18-$15).

Computation of unrealized holding gains, however, requires information on replacement costs as of the start of the particular year. Since 1976 was the first year for which replacement cost data were disclosed via the 10-K report, this information was not available for the previous year-end. Accordingly, it was impossible to compute unrealized holding gains for this study. Nevertheless, some notion of the impact of unrealized holding gains can be found in Table II. The percent change in the balance sheet items of inventory and fixed assets is derived from the cumulative unrealized holding gains which have accrued on these items to the firms since their acquisition.

Replacement cost income, without holding gains, was defined for this study as follows for purposes of computing the profitability ratios:[5]

$$NI_{RC} = NI_{HC} - \Delta DEPR - \Delta COS$$

where:

NI_{RC} = Replacement cost income

NI_{HC} = Historical cost income

Δ DEPR = Increase in depreciation under replacement costing

Δ COS = Increase in cost of sales under replacement costing

A summary of the impact on income of replacement costs as compared to historical costs show that there is an average decrease in income of approximately 70 percent when depreciation and cost of sales are restated to reflect replacement costs. Furthermore, the median percent decrease in income exceeds 28 percent. Thus, it is apparent that there are significant decreases in income under replacement costing as defined in this study when excluding holding gains. In fact, better than 10 percent of the firms (17 firms) resulted in a net loss using replacement costs, where income had been positive using historical costing.

The two profitability measures examined in this study, profit margin and return on total assets, employed the above definition of replacement cost income. These ratios endeavor to measure management's ability to generate profits. As such, they are significant ratios often computed by financial statement users. The ratios were computed as follows, assuming (1) historical costing, and (2) replacement costing:

$$\text{PROFIT MARGIN} = \frac{\text{NET INCOME}}{\text{SALES}}$$

$$\text{RETURN ON TOTAL ASSETS} = \frac{\text{NET INCOME}}{\text{TOTAL ASSETS}}$$

Relevant statistics for profit margins computed under historical and replacement cost conventions, employing traditional historical costing methods, indicate that net income averaged 10.4 percent of sales for the firms examined in this study. As expected, when income was recomputed using replacement costs, the profit margin decreased substantially to 6.9 percent. Finally, as a measure of the relative change in the performance measure, the percent change in the ratios were calculated for each firm. Specifically, the following was computed for each firm for each type of ratio examined in this study:

$$\frac{Ratio_{RC} - Ratio_{HC} \times 100}{Ratio_{HC}}$$

where:

$Ratio_{RC}$ = Ratio computed using replacement cost data

$Ratio_{HC}$ = Ratio computed using historical cost data

On the average, profit margin decreased almost 70 percent when replacement costs were employed instead of historical costs.

In the second measure of profitability, return on total assets, both variables are affected under replacement costing, those being net income and total assets. Total assets reflecting replacement costs were computed as follows:

$$TA_{RC} = TA_{HC} + \Delta \text{ Inventory} + \text{Net Depreciable Assets}$$

where:

TA_{RC} = Total Assets under replacement costing

TA_{HC} = Total Assets under historical costing

Δ Inventory = Increase in Inventory under replacement costing

Δ Net Depreciable = Increase in Net Depreciable Assets under replacement costing

Thus it could be expected that the computed return on total assets ratios would decrease under replacement costing, with the lower net income numbers generally being associated with higher valuations for total assets.

A significant fact is that as the mean decreases, the variability as measured by the standard deviation increases. This results from the fact that depreciation increases significantly when adjusted for replacement cost. Also, with depreciation being the most significant component in adjusting net income under replacement costing, this increase in variability tentatively confirms the untested hypothesis of Revsine when he stated:

> One could contend that for fixed asset accounting, replacement cost results will be more diverse than historical cost measures. The reason why historical costing is likely to be

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> relatively more objective is a function of the generally determinate initial asset carrying value employed in historical costing. All measures using a historical cost system would arrive at a basically similar depreciation base for a given asset through reference to its original invoice cost. Close agreement on a depreciation base is not so likely among measures using replacement costing.[6]

This contention is based in part on the fact that various methods exist for the generation of replacement cost data for fixed assets (i.e., price indexes or appraisals).

Thus, although the profit margin and return on total assets ratios meet the concept of "dimensional soundness" after being adjusted for replacement cost data in agreement with ASR No. 190, there appears to be an increase in the variability of the resulting assets on a cross-sectional analysis of firms. Therefore, a financial ratio user would be wise to ascertain the method used by each individual firm in generating the replacement cost data in the evaluation or replacement cost ratios, since the magnitude of the computed values is a function of the method used. Without such a determination, it would be difficult to argue that ratios computed with replacement cost data are superior to those calculated using historical costs.

Activity Measures' Results

In addition to measuring relative profitability, traditional financial statement analysis has also been concerned with deriving information on a firm's relative operating efficiency. So-called "activity" ratios commonly provide such information. Two widely used measures were analyzed in this study: asset turnover and inventory turnover. These ratios were calculated as follows:[7]

$$\text{ASSET TURNOVER} = \frac{\text{SALES}}{\text{TOTAL ASSETS}}$$

$$\text{INVENTORY TURNOVER} = \frac{\text{COST OF SALES}}{\text{ENDING INVENTORY}}$$

The asset turnover ratio simply indicates the number of times per year that total assets were "turned over" in the form of recognized sales. Using historical costs, firms on the average managed to generate sales equal to 1.35 times the reported total assets. When the higher replacement costs were used to measure total assets, however, the mean asset turnover dropped to 1.27. There was a decrease in computed asset turnover measures averaging 6 percent.

These asset turnover statistics also provide further explanation of the profitability results reported above. Observe that:

$$\text{Profit Margin} \times \text{Asset Turnover} = \text{Return on Total Assets}$$

or:

$$\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Therefore, the general decline in return on total assets with replacement costing discussed in the preceding section is at least partially due to the systematic decrease in asset turnover as described here.

The final performance measure explored in this study was inventory turnover. Basically, this ratio provides information on the number of times that the inventory in stock is sold during the year. Inventory turnover measures under replacement costing were computed by modifying both the numerator, (cost of sales), and the denominator, (inventory), to reflect the generally higher replacement costs. When historical costs are employed, inventory is turned over on an average of 6.27 times. When the ratio was changed to include replacement costs, however, the measure declined to an average of 5.14 times. Thus it appears from this and other data that the influence of replacement costs once again results in a general decline in the computed activity measure.

Conclusions

From this cross-sectional analysis study the following tentative conclusions may be drawn. First, there does exist a distortion in ratio components as a result of changes in prices which thus violates, in the computation of certain ratios, the concept of "dimensional soundness." Second, with the current SEC requirements for replacement cost disclosure, a financial statement user should be aware that financial ratios employing replacement cost data can and do differ significantly from those computed using historical costs. As a result, the statement user should have some "ball park" ideas as to the statistical characteristics of selected ratios when adjusted for ASR No. 190-- the main objectives of this study.

Finally, the financial ratio analyst should proceed with caution in employing replacement cost data as presently disclosed. Although the concept of "dimensional soundness" may be met, selected ratios increase in variability when adjusted for replacement cost data resulting in less objectivity (more dispersion) in those ratios.

The observed results outlined above must be tempered by certain limitations of this study. First, the method used to select the sample of firms does not permit generalizations to be made to firms not included in this study, although a relatively wide cross-section of industries was analyzed. Also, SEC requirements on the disclosure of replacement cost data are limited to inventory, fixed assets, cost of sales, and depreciation expense. Therefore, the effects of replacement cost adjustments on other balance sheets or income statement items have been ignored.

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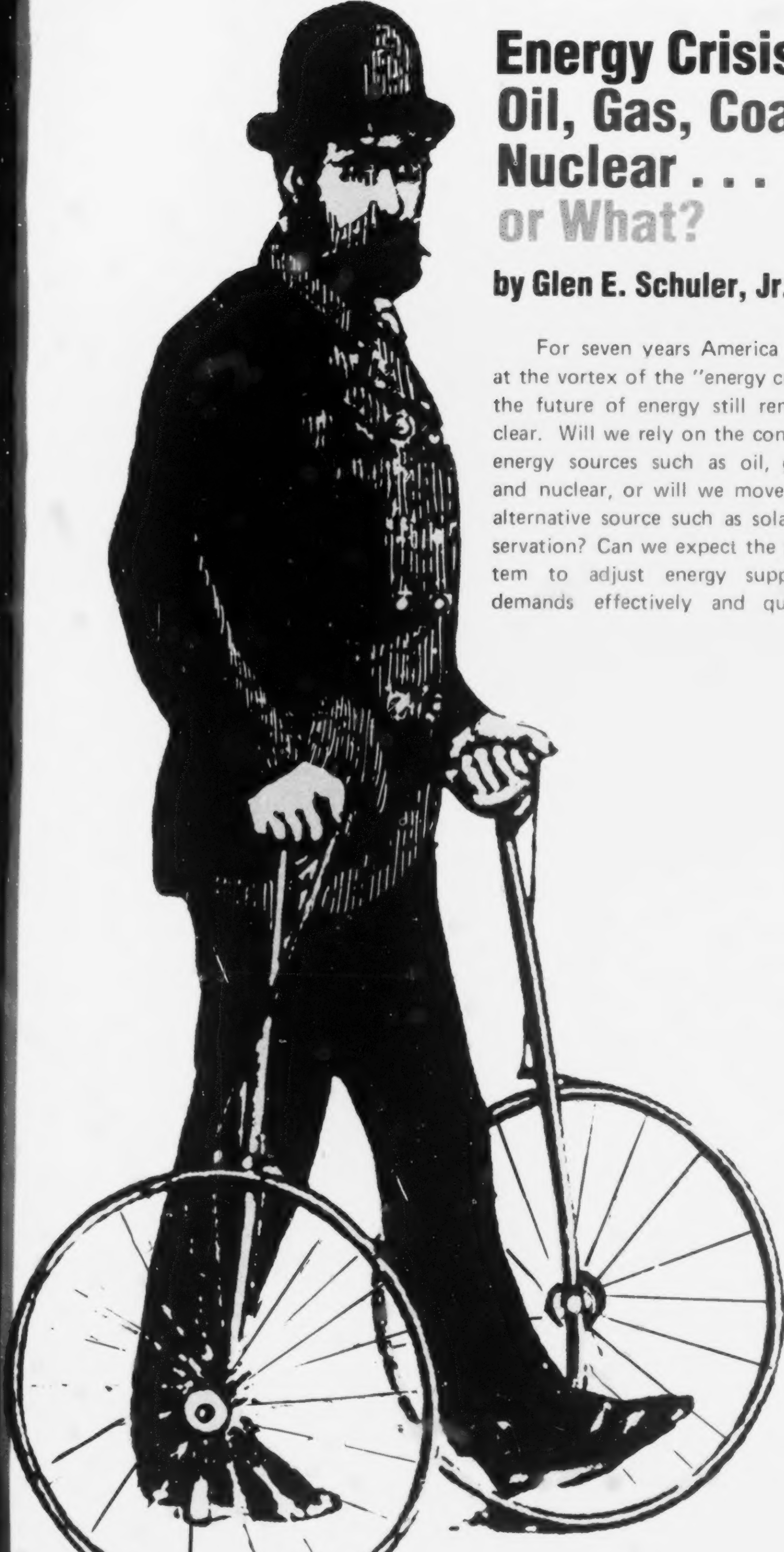
1. Lawrence Revsine, ***Replacement Cost Accounting*** (Englewood Cliffs: Prentice-Hall, Inc., 1973.)
2. Ibid., p. 182.
3. James A. Heintz, "An Analysis of SEC Replacement Cost Data," ***Proceedings of the 1978 Meeting***, Midwest Region, American Accounting Association.
4. The computations of replacement cost adjusted income in this paper assume that there is no change in the amount of recognized income tax expense (i.e., the differences which exist between replacement costs and historical costs are so-called "permanent differences").
5. *Op. cit.*, Revsine, p. 72.
6. It is a generally accepted practice to state the denominators for both activity ratios in terms of the "average" amount during the year as opposed to just the year end valuation. However, as we stated earlier, only year-end replacement costs are available for 1976 and thus were incorporated into this study. ■



Energy Crisis: Oil, Gas, Coal, Nuclear . . . or What?

by Glen E. Schuler, Jr.

For seven years America has lived at the vortex of the "energy crisis," yet the future of energy still remains unclear. Will we rely on the conventional energy sources such as oil, gas, coal, and nuclear, or will we move to some alternative source such as solar or conservation? Can we expect the price system to adjust energy supplies and demands effectively and quickly to bring them into a reasonable balance over the next decade as many strictly market-oriented analysts hope? The price system can eventually solve the "energy crisis," but not over the next decade. If a solution, or at least a good start, to solving the crisis is not forthcoming over the next decade, the strains on our economic and political system could be extremely undesirable. In fact, it is even conceivable that the strains could transform our system into a form far different in concept and in action from the relatively free and open system we now live in.

Four major problems inhibit the price system from resolving the current energy crisis quickly. First, although energy prices have risen, causing substantially higher exploration rates, the increase in the domestic reserves of natural gas and oil has not been impressive. It appears that the biggest and most easily accessible deposits of oil and natural gas have already been found. If, indeed, a domestic geologic limitation to new large finds of oil and gas is being approached or has been reached, increasing oil and gas prices will not bring forth additional supplies. Most prognosticators expect domestic oil production to continue to decline and domestic natural gas production to remain stable through 1990 even with vastly higher energy prices. **If we persist in using oil at current levels, we can become only more dependent on imports from countries where oil is a political club as well as an economic asset. Since we are not producing as much oil as in the past, we must either consume less and seek alternative energy forms or import more.**

The second complication to the price system is OPEC. Economic models can be constructed which conclude that OPEC is simply maximizing revenue by setting its selling price, given its crude output level. If cartel decisions were being made by the large multinational oil firms, this argument might seem feasible. In reality, these decisions are being made by what must be considered fairly vulnerable governments, as recent events in Iran point out. OPEC's oil price policy is making the long- and short-term importation of oil a risky as well as an expensive proposition. Coupling these facts with declining domestic oil production levels, we must either start to make a transition to an alternative energy source, or we shall be forced to become more dependent on imported oil and thereby on the political winds that blow in these areas. Some informed individuals say that we should transfer our imports to friendly countries such as Mexico. This scheme will not obviate the problem, however, since we would still remain a potential hostage to the political climates within these countries.

Others complain that these problems result from domestic oil prices being regulated and kept below world levels, thus causing domestic supplies to be withheld from the market. If geologic supply limitations are being encountered, this argument is not valid, since no additional new supplies will be forthcoming at any price. Still, higher domestic prices are beneficial because they make alternative energy sources more competitive with oil and natural gas.

Another problem with the price system is that it does not adequately account for the externalities that occur due to our consumption of the various energy forms, and this influences our willingness to utilize them. Externalities are the benefits and costs that flow to third parties as other parties undertake economic transactions. Coal is an excellent example of an energy source that has many externalities associated with its production and consumption. The acid runoff from strip mining wastes, which kills animals and pollutes drinking water, is an example of a production externality. Often the cost of replacing the animals or purifying the drinking water (over and above normal purification) is not accounted for in the price of coal. The injured third party must pay, and this leads to a misallocation of resources. If strip mining firms are forced to bear these costs, they then have incentives to avoid the injury done to the third parties.

Another example of a coal-caused externality is the sulfur oxide emission from utility smokestacks that causes disease and a phenomenon called acid rain. Since utilities have not until recently taken these costs into account when pricing electricity, they have priced it too low. This leads to an overuse of electricity relative to a situation where the utilities' prices reflect all costs of production, including the externality. Recently, with the environmental law changes, both strip mines and utilities are being forced to bear some of these costs. Strip mines must now take measures to forestall runoff, and utilities must employ scrubbers to reduce the sulfur emissions to acceptable levels at their coal-fired plants.

The recognition of these externalities has two pronounced effects: first, they substantially increase the cost of providing a particular energy type. The burning of low sulfur coal that needs no scrubbers is an expensive proposition at eastern utilities, since only western low sulfur coal really meets utilities' needs. If an adequate coal transportation network existed to move the coal to the East, it would still add substantially to the cost of providing electricity from coal. The rub is that the transportation facilities do not exist, and their development will take years and a substantial investment. The alternative approach that utilities must follow is the use of high sulfur eastern coal and the installation of extremely expensive scrubbers. Either procedure greatly increases the cost of generating electricity with coal, and as these costs are included in the generation process, coal becomes less competitive with oil and gas. This in turn will cause a faster utilization of oil and gas and more imports.

In addition, making the public aware of these externalities means influencing their willingness to accept certain energy forms. The most obvious example of this situation is the growing hesitation of the public to accept nuclear energy as an alternative to oil, gas, and coal in the generation of electricity; and since the Three Mile Island mishap, we have become even more apprehensive about the safety of nuclear energy. This apprehension has placed a de facto indefinite moratorium on the siting of new plants and may even stop certain plants in construction from coming on line.

Another issue in the nuclear debate concerns the disposal of nuclear wastes. If no additional permanent sites are developed by the middle 1980's, when existing sites are projected to be filled, nuclear usage will have to be halted until new disposal areas are developed. Coupling this with the move by states to limit access to existing waste disposal sites only compounds the problem. In short, each state will probably have to designate an area within its boundaries where its nuclear waste can be disposed. The public's fear of an accidental radiation leak from this waste could further reduce their willingness to accept nuclear energy as an alternative to oil, coal, and gas.

Finally, technology may be another factor limiting the nation's ability to adjust quickly to energy price changes. For example, the Carter National Energy Plan assumes that much of our near-term, additional energy needs can be met by coal due to our large domestic reserves. As Stobaugh and Yergin explain in their book, **Energy Future**, the coal industry (especially the deep mining group, but to some extent the strip mining group as well) does not use the most efficient and up-to-date extraction equipment, nor is its labor force sufficiently trained to use the advanced equipment. In essence, the coal industry has not been modernized, and before it can be expected to meet the Carter Energy Plan goals, it must be restructured to utilize the most efficient coal mining techniques. In short, as other energy prices rise relative to coal,

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coal will become more competitive, but only when the investments in the newer technologies are completed will this industry be able to fulfill the nation's coal needs.

Over the next decade, even with vastly higher energy prices, domestic oil production will fall, and domestic natural gas production will remain constant. Coal will not be able to meet the goals set up in the National Energy Plan and may fall considerably below expectations if the industry does not modernize and if the environmental uncertainties in coal's use are not clarified. Finally, nuclear energy's future is a question mark, especially since Three Mile Island. At best, by 1990 nuclear will provide only 7 percent of our energy needs, and in all likelihood, it will meet considerably less, possibly only 4 percent.

Tables 1 and 2 present a recent set of estimates of the domestic contribution of the conventional energy sources to the supply of energy for the years 1979 and 1990. The numbers in these tables are in quadrillion British Thermal Units--that is, quads. Although the total domestic energy supply from these sources is expected to grow from 54 quads in 1979 to 63 quads in 1990, only coal displays substantial growth over these years, rising from 14 to 24 quads. In addition, if these results are compared with a set of domestic energy consumption estimates prepared by the Resources for the Future (RFF),[1] the adequacy or inadequacy of 1990 domestic energy supplies to meet demands can be determined.

RFF projects that 1990 domestic energy consumption will be between 99 and 110 quads, indicating that domestic conventional sources will fall 34 and 46 quads short of meeting demand. If no additional energy sources are utilized, then imports of oil and gas will have to rise from 21 quads in 1979 to between 35 and 47 quads by 1990, with 26 to 38 quads being oil imports. That is, this scenario implies that we will be more and not less dependent on foreign oil by 1990--more dependent, that is, if we make no adjustments to our present energy consumption and production patterns.

But what actions can we undertake to alter these patterns to a more desirable outcome? Two basic alternatives exist to the conventional energy sources--conservation and small-scale solar. Other alternatives to the current conventional energy sources include synthetic fuels and the breeder nuclear reactor. These sources are not discussed here, since they are not currently economically competitive with the conventional energy forms. Nevertheless, their longer-term potential is great, and they should be supported through research and development programs. The breeder reactor, for example, will create fuel, thereby greatly expanding its uranium feedstock supply.

Conservation should be considered an energy source. We should not abandon the price system; that is, the conventional energy forms ought to be priced at their market-determined values. Past subsidization of conventional energy sources has caused them to be overused, leading conversely to an underutilization of the alternative sources. Battelle[2] estimated that the incentives and subsidies offered to conventional sources have been in the range of $120 billion, whereas the incentives and subsidies offered to conserve or use solar have been negligible. Therefore, in order to allow the alternative sources a fair break, they should be subsidized in turn through government tax credits, while the other sources are priced through the market. In addition, the incentives offered by the government must be thought of only as moving these alternative sources over an initial acceptance hurdle. As Mandique has suggested in the book **Energy Future**, once they have become accepted and viable with the conventional sources, the incentives should be phased out.

Conservation offers the best alternative to imports of oil. Various authors have suggested that conservation could reduce our energy needs by up to 20 percent. This can probably be accomplished without slowing the rate of economic growth. Over the last 100 years the energy-to-GNP ratio has varied significantly. It grew over the 1880-to-1920 period, fell from 1920 to 1940, and displayed little variation from 1940 to 1975.

Over the last few years, however, this ratio has fallen, and many forecasters expect this trend to continue; therefore, there is no reason to believe that the energy-to-GNP ratio is a constant, as many have suggested. The lower energy-to-GNP ratios of many European countries which have displayed reasonable growth support this conclusion to some extent. Considerable opportunities for conservation exist in this country. In transportation, cars can be made even more fuel efficient; in manufacturing, management can become more energy-conscious and the cogeneration of electricity and industrial steam can be undertaken; and in construction, building codes can be made more conservation-oriented, and existing structures can be retrofitted. **Many of these measures can be made more attractive through government tax credits and by allowing utilities to enter the conservation business. Utilities can inform households and firms about conservation techniques and then make low-interest loans to aid in the implementation of the recommended measures.**

Still, given the large number of energy users, the probability that they will remain uninformed about the existing conservation measures and techniques, even with the incentives, is great. One approach the government can use to overcome the lack of information about existing conservation measures is through energy-conscious regulations. For example, additional mileage-per-gallon fuel efficiencies can be enacted, or minimum insulation requirements for an area's buildings can be implemented. Although conservation is not a glamorous approach, it is potentially the most effective short-term source for solving the current energy dilemma.

TABLE 1

DOMESTIC SOURCES OF ENERGY SUPPLY, 1979 (Quadrillion BTU's)

Energy Source	Domestic
Oil	18[a]
Gas	18[b]
Uranium	4
Coal	14
TOTAL	54

Notes:

a. Imported oil = 19 quads

b. Imported gas = 2 quads

Source: *Building a Better Future: Economic Choices for the 1980's* (The New York Stock Exchange, Office of Economic Research), December 1979.

TABLE 2

DOMESTIC PROJECTED SOURCES OF CONVENTIONAL ENERGY SUPPLY, 1990 (Quadrillion BTU's)

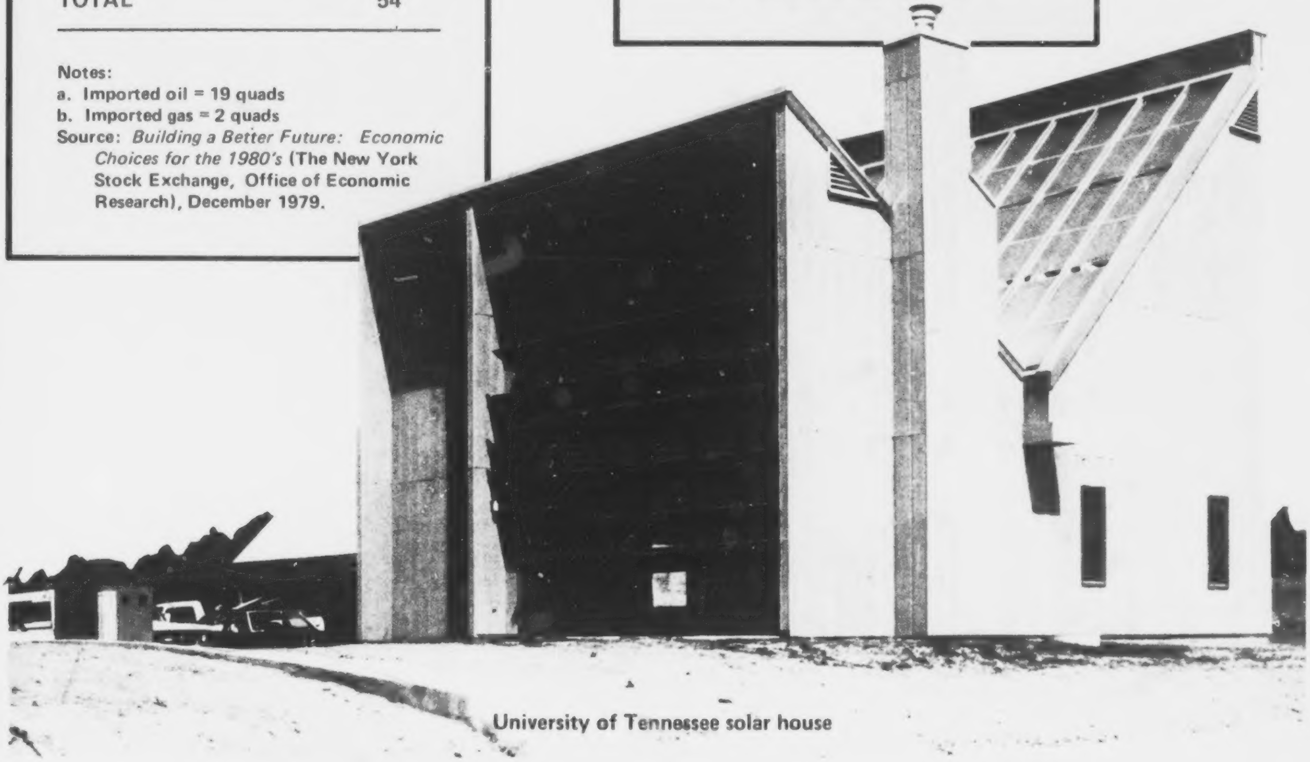
Energy Source	Domestic
Oil	18
Gas	16[a,b]
Uranium	5
Coal	24
TOTAL	63

Notes:

a. Predicted imported gas = 9 quads

b. Notice that this projection for oil differs a little from the prognostication for oil in the text, where oil production is expected to decline. This table is an optimistic scenario.

Source: *Building a Better Future: Economic Choices for the 1980's* (The New York Stock Exchange, Office of Economic Research), December 1979. A 5.0 percent growth rate is used rather than the 7.1 percent growth rate of the New York Stock Exchange Report.



University of Tennessee solar house

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Approximately 20 to 25 percent of the nation's energy needs "could" be met by solar energy forms with existing technology, but it will probably not meet this goal over the next decade even with incentives. Solar has vast, but, as yet, largely untapped potential, including thermal heating and cooling, fuels from biomass, solar electric (i.e., large-scale solar thermal, photovoltics, wind, ocean, and hydropower).

Large-scale solar applications are neither technologically nor economically feasible at this time. Small-scale solar for heating and cooling is feasible, but as Mandique[3] states, the primary barriers to its implementation are not technological or economic, but institutional. Small-scale solar technology exists and the payback period appears to be in the range of 8 or 9 years. The institutional barriers include building codes that do not provide for solar, a construction work force that is untrained in solar installation, and utilities which perceive solar as a competitor. **Building codes can be changed, but without a trained work force that can install solar equipment, little progress will be made. To improve the construction work forces' ability to install solar equipment, the government can offer tax credits to individuals that obtain training in this area.** In addition, to improve the payback period on solar investments to about five years, which conventional wisdom thinks is a necessary condition to undertake such investments, tax credits in the 55- to 60-percent range are needed. These are about twice the size of the tax credits provided to solar investments in the 1978 National Energy Plan. (California, for example, offers tax credits in this range and, with their building codes that are favorable to solar, they have become the most solarized area in the nation.) The government can also make low-interest loans available to homes that solarize. Finally, utilites must support the move to solar home heating and cooling. If they do not, the potential for solar is not that optimistic. Hopefully, when these incentives are implemented, the utilities will recognize that they can have a role in installing and maintaining solar equipment. (In California, where the solar incentives are the greatest, the utilities are most directly supportive of and involved in solar.)

One reason solar equipment remains expensive is due to the limited size of the production runs at the industry's plants. If governments support solar through tax credits and regulations, the increased demand for solar equipment would enable firms to produce at levels of output that would allow them to capture certain large-scale production cost economies. Larger scales of production will also bring additional research and development funds from the private sector. If, in addition, substantial research and development funds are also forthcoming from the government sector on small-scale and not large-scale frill-type solar projects, these costs would decrease even faster. Moreover, the technological benefits of solar research may have payoffs in areas other than home heating and cooling. For example, the solar cells developed for the Skylab have been adapted to operate wrist watches.

In conclusion, simply because energy prices have risen does not mean that domestic conventional energy supplies will increase adequately to meet our future needs. Too many obstacles inhibit a smoothly functioning price system response to the energy crisis. These obstacles are diverse, ranging from OPEC to price regulation to public uncertainty about the conventional energy forms. In addition, the existing pricing system has biased our usage away from certain attractive alternative energy sources such as conservation and solar. If we are to respond adequately to the energy crisis, Our only "quick" short-term response must be conservation. **Over the longer run, we must seek an alternative to the current conventional sources. Small-scale solar appears to be a reasonable alternative form, since it is renewable and not imported from an interruptable source.** Since the price system has been biased away from these alternatives, incentives such as tax credits and building codes that stress the alternative energy forms must be enacted by either state, local, or federal governments in order to give them a fair chance in the marketplace. The incentives should be enacted on the assumption that they are temporary and are needed only to get these energy forms over an initial acceptance hurdle. Once they become accepted and are substituted for the existing conventional energy sources, the incentives will no longer be necessary. In addition, the temporary incentives program offers a way out of these alternative energy sources as well, if other alternatives are found or if it is concluded that they are not, indeed, substitutable for the existing conventional energy forms.

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1. Sam H. Schurr, *et al.*, *Energy in America's Future: The Choices Before Us* (Baltimore: Johns Hopkins University Press, For *Resources for the Future*, 1979). See especially Part II: Energy Consumption.
2. Battelle Memorial Institute, *An Analysis of Federal Incentives Used to Stimulate Energy Production* (Springfield, Va.: National Technical Information Service, March 1978).
3. Robert B. Stobaugh and Daniel Yergin, *Energy Future: Report of the Energy Project at the Harvard Business School* (Random House: New York, 1979).

This article, essentially a review of a limited energy literature, was originally presented in slightly modified form as a speech at the December 6, 1979 Seminar on the Economic Outlook for the 1980's at Kingsport, Tennessee. Many of the conclusions here, often presented without formal citations, can be found in the book *Energy Future: Report of the Energy Project at the Harvard Business School* by Robert B. Stobaugh and Daniel Yergin (Random House: New York, 1979).

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Economic Outlook Survey: Looking Ahead to 1981

Patricia D. Postma, Research Associate, Center for Business and Economic Research, The University of Tennessee, Knoxville

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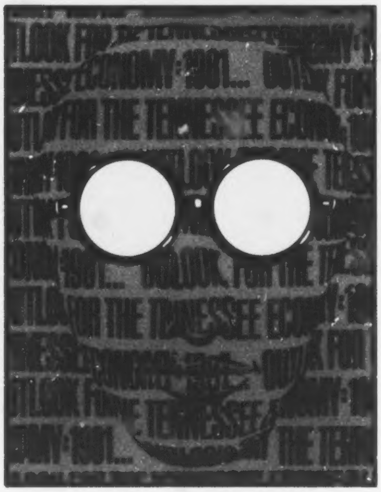
Outlook for the Tennessee Economy

Stephen P. Coelen, Research Associate Professor, Center for Business and Economic Research, The University of Tennessee, Knoxville


OUTLOOK FOR THE TENNESSEE ECONOMY 1981...

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Tennessee Graphics

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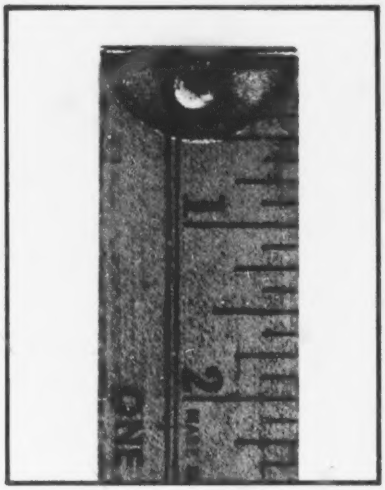
Tennessee Economic Sector Activity in the 1980's

William F. Fox and Glen E. Schuler, Jr., Research Assistant Professors, Center for Business and Economic Research, The University of Tennessee, Knoxville



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State Data Center Offers Public Services

Patricia D. Postma

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Director's Comments

This issue of the **Survey** contains the twelfth annual analysis of and outlook for the Tennessee economy.

Responses of the 140 members of the 1981 Economic Outlook Business Panel are summarized by Patricia Postma in the first article of the issue. Key economic issues the panel expects Tennessee decision makers to have to deal with in 1981 are identified and elaborated upon. Also presented are tabulated panel views on continuing national and state problems in energy and inflation.

In the Outlook for the Tennessee Economy for 1981-1989 and Tennessee Economic Sector Activity in the 1980's, authors Stephen P. Coelen, William F. Fox and Glen E. Schuler, Jr. summarize and highlight the most recent economic forecasting and analysis activity undertaken in the Center for Business and Economic Research. This ongoing activity combines the Tennessee Econometric Model, a substantial tool aiding regional analysis, with the professional judgment of a dozen faculty at the University from the Departments of Economics, Finance, Marketing and Transportation, and Agricultural Economics. Leadership for the economic forecasting projects is provided by Professors S. P. Coelen, W. F. Fox, and Glen E. Schuler, Jr. Contributing faculty authors are identified on the facing page.

The issue concludes with a brief outline of the Tennessee State Data Center, a joint project of the Tennessee State Planning Office and the Center for Business and Economic Research. This project is designed to ease the access of private and public sector entities and individuals to the full range of basic socioeconomic data on the state.

The primary objective of this issue of the **Survey** is to provide the widest possible dissemination of the most timely national and state economic analysis as examined by a cross section of both concerned practitioners and professionals for the benefit of all our readers, and most particularly, those within our society charged with specific planning and decision-making responsibilities.

David A. Hake
Center for Business and
Economic Research

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* These panelists have served five or more years since the first Economic Outlook edition.
† These panelists have served ten or more years since the first Economic Outlook edition.

Looking Ahead: ECONOMIC OUTLOOK SURVEY

Patricia D. Postma

Inflation, the high cost of energy, and high interest rates have all negatively affected the Tennessee economy in 1980. A drop in construction, expendable income, investment dollars and unemployment is the result. . . . Our challenge is to reverse the trends.

A West Tennessee Businessman

With the new industries locating in the state, the future should be bright for Tennessee compared to the rest of the nation. Our strength lies in an abundant supply of easily trained labor, many natural resources, and our central location for the eastern United States.

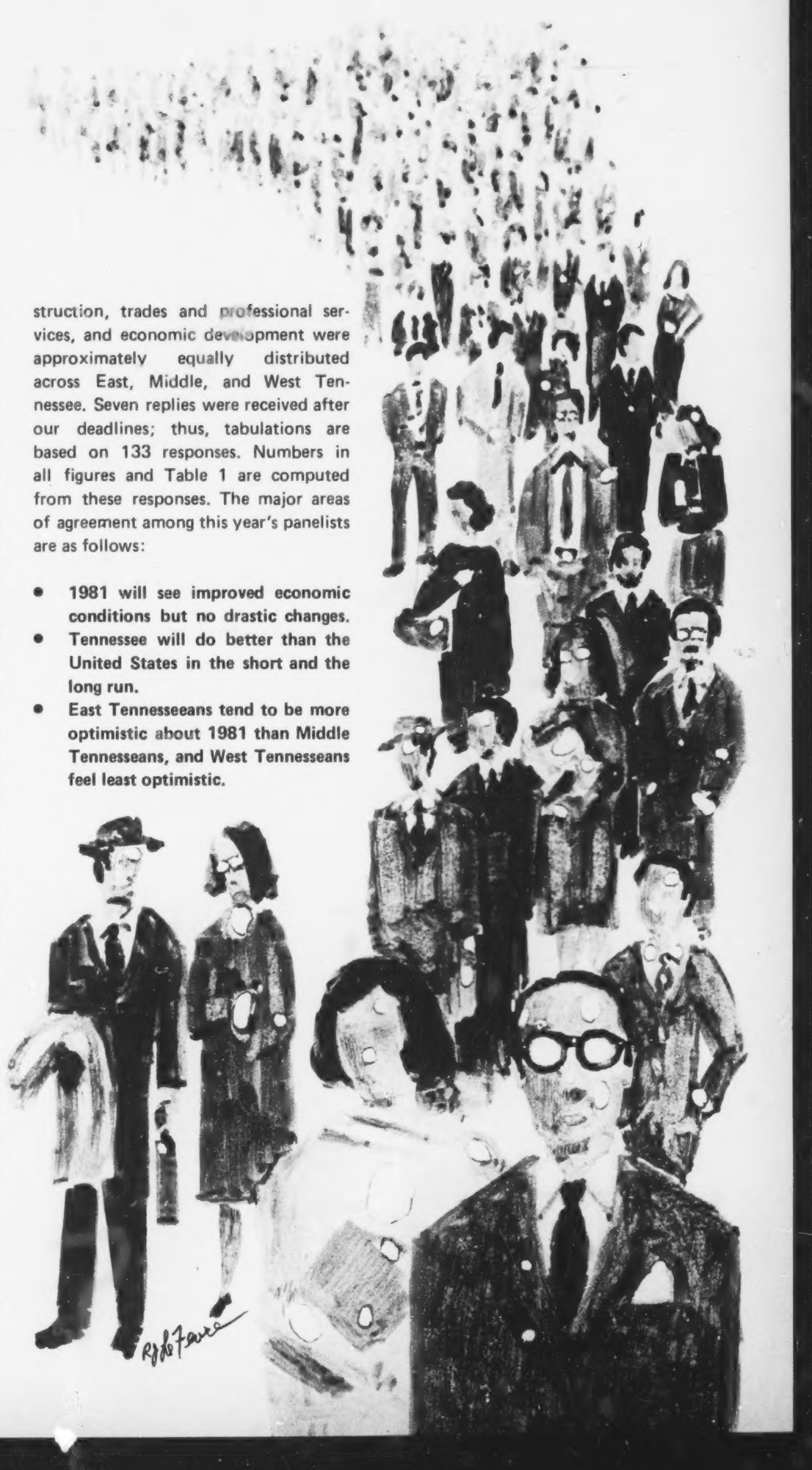
An East Tennessee Manufacturer

The recent announcements of new industries moving to Tennessee and the apparently well organized effort to attract new industries will materially raise Tennessee's overall economic levels. The swing to a more conservative national posture, if it lives up to expectations, will stimulate growth in Tennessee. Policies to reduce federal regulations and to push government closer to people will help. The state has excellent potential to be a leader in alternate energy resources.

An East Tennessee Publisher

These quotes from survey respondents to the twelfth Economic Outlook Survey are representative of the group across the state. Although these Tennesseans feel that the problems are difficult and that many are national in origin, there is a general optimism about Tennessee's strengths and a consensus as to the problems. The 1981 survey responses from 140 business men and women in finance, manufacturing, construction, trades and professional services, and economic development were approximately equally distributed across East, Middle, and West Tennessee. Seven replies were received after our deadlines; thus, tabulations are based on 133 responses. Numbers in all figures and Table 1 are computed from these responses. The major areas of agreement among this year's panelists are as follows:

- **1981 will see improved economic conditions but no drastic changes.**
- **Tennessee will do better than the United States in the short and the long run.**
- **East Tennesseeans tend to be more optimistic about 1981 than Middle Tennesseans, and West Tennesseans feel least optimistic.**



- **High costs, especially high interest rates, are everyone's major problem.**
- **Tennesseans are practicing energy conservation and continue to be concerned about costs and supply.**

Improved Conditions in 1981

In the section of the Outlook Survey which requested panelists to state their expectations for Tennessee in 1981, the general outlook was for stable conditions or only slight changes. Although at the time panelists responded to the 1981 Outlook Survey the prime rate was above 18 percent, very few expected it to remain there. Most panelists expect the prime rate to stay between 11 and 14 percent during 1981. Productivity and unemployment rates were other areas expected to improve in 1981, especially in the view of manufacturers.

The survey asked panelists to indicate their expectations for 19 different economic factors. Of these, 13 were expected to improve, 5 were expected to worsen, and there was no consensus for the remaining factor. Table 1 reveals that while the magnitude of improvements was expected to be slight, the worsening factors--wage demands, consumer price level, and especially energy costs--were expected to worsen moderately or substantially. The worsening factors are not unrelated. As one panelist pointed out, energy costs contribute to the consumer price level and both have led workers to demand higher wage increases. As seen in Table 1, the consensus of the 1981 Outlook Panel is underscored by the fact that only with respect to the direction of the interest rate was there a minority disagreement of more than 25 percent.

When asked to analyze the prospects for their own industries rather than those for Tennessee as a whole, panelists showed differences in expectations. In Figure 1 it is apparent that respondents from Tennessee's financial sector expect their business to improve less than other sectors, and manufacturers appear most optimistic. The explanation for the less optimistic expectations of the financial sector can perhaps be found in the fact that it views itself as more closely tied to national business cycles than does the Tennessee manufacturing sector. Nearly all panelists are more optimistic for the state than for the nation.

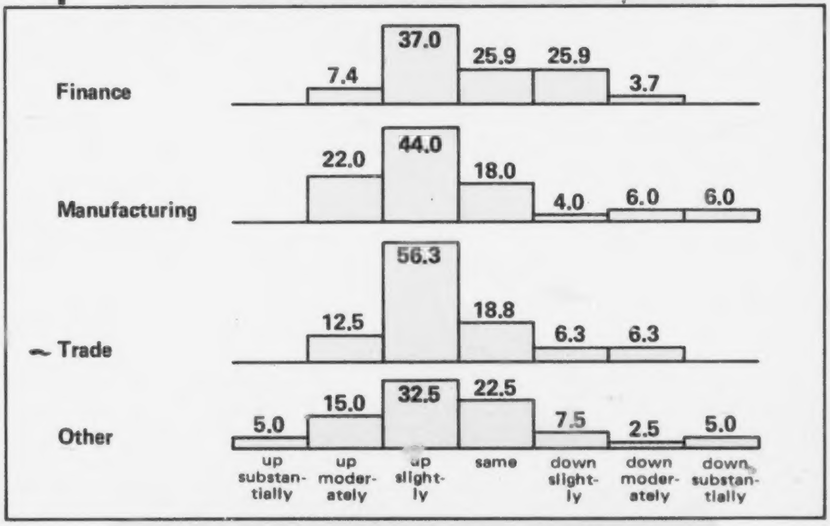
Tennessee's Relative Strengths

The seriousness of higher energy and wage costs, along with an increasing consumer price level, were not downplayed by the panelists--they were a pervasive theme in responses and comments--yet they are problems that affect not only Tennessee, but the whole United States. Figure 2 shows the similarity of the overall expectations for the two economies, yet most respondents expected Tennessee to fare better than the nation. Many panelists specifically noted the active and successful role of the state in locating industry in Tennessee. Two bankers, one from East Tennessee and one from West, commented on this: **Tennessee continues to attract new industry as well as seeing its existing plants expand. I feel the state has an excellent program in this regard.**

Our strength is our excellent labor market and the training programs for workers offered by the state, along with the excellent cooperative efforts between the executive and legislative branches of state government in expanding our economic base.

In a special section of the 1981 Outlook Survey addressed to Tennessee manufacturers, the state's business strengths were illustrated by the fact that in spite of economic uncertainties, 78 percent of the manufacturers had considered expanding their operations recently. In a hypothetical question, manufacturers were asked to state where they would place additional facilities if they were expanding. Sixty-two percent of the manufacturers said they would expand in Tennessee, and of these, two-thirds would expand in the county in which they are presently operating. This apparent satisfaction with Tennessee as a business location was borne out by the manufacturers when they were asked to list the strengths and weaknesses for industrial operations. Few of the manufacturers cited disadvantages: many cited advantages, and advantages were rarely listed singly. In the responses made by manufacturers, more often than not, five or six of the strengths were cited together. Cited as the major strengths of Tennessee as an industrial location were the

1 **Expectations for Tennessee's financial sector . . .**



are not as optimistic as those for manufacturing.

TABLE 1

TENNESSEE ECONOMIC OUTLOOK

EXPECTATIONS OF STABLE OR IMPROVING CONDITIONS IN 1981

	Panelists' Responses (in percent)		
Factor	**No Change**	**Slight Improvement**	**Moderate or Substantial Improvement**
Unemployment rate	17.3	52.6	14.3
Supply of skilled labor	48.9	26.3	5.3
Attracting managerial personnel	47.4	32.5	6.8
Supply of transportation services	51.1	22.6	8.3
Availability of energy	51.1	27.1	11.3
Interest rates on loans	13.5	40.6	8.3
Plant capacity utilization	21.8	54.1	8.3
Residential construction activity	23.3	39.8	12.9
Commercial-industrial construction activity	14.3	42.9	21.1
Consumer demand	27.1	46.6	8.3
Business-government cooperation	36.8	32.3	10.6
Supply of short term capital	35.3	36.8	15.8
Supply of investment capital	28.6	36.1	16.6

EXPECTATIONS OF STABLE OR WORSENING CONDITIONS IN 1981

	Panelists' Responses (in percent)		
	No Change	**Slight Worsening**	**Moderate or Substantial Worsening**
Demands for wage increases	21.8	33.8	35.3
Labor-management problems	41.4	27.1	11.3
Cost of energy	0.8	19.5	79.0
Business costs compared to revenues	11.3	48.9	34.6
Consumer price level	11.3	40.6	39.1

following factors: abundant, stable labor supply; right-to-work laws; low wages; low taxes; favorable attitude of state government toward business; central location to eastern United States; moderate climate; and availability of energy.

Of the weaknesses, increasing electric rates were listed most often. Other disadvantages listed were strong unions and inadequate numbers of skilled laborers.

Geographic Differences in Expectation

Of the 133 panelists, 47 were from East Tennessee, 45 were from Middle Tennessee, and 39 were from West Tennessee. This approximately equal distribution did not always result in similar responses. Where there were differences in the outlook for 1981, East Tennessee panelists frequently appeared to have more optimistic expectations. In contrast to those from East Tennessee, the concerns of West Tennessee panelists indicated slack in employment, plant utilization, construction activity, and consumer demand, along with a scarcity of skilled labor and investment capital. Figure 3 indicates some of the areas in which expectations were different across the state.

Key Economic Issues in Tennessee

Each year panelists are asked to indicate which of 19 economic issues represent the most serious problems for Tennessee in the year ahead. For the

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past five years the concerns revealed by this ranking have been remarkably consistent, centering on increasing costs. The level of interest rates, which is of foremost concern in 1981, held the same rank in 1979. Energy costs are the second in priority of the panelists' key issues, and except for 1979, the cost of energy has been rated first or second over the five-year period. Similarly, the 1981 panelists placed third the problem of business costs increasing faster than revenues, whereas for five years that problem had held either first or second place. Figure 4 places the key issues selected by this year's panelists in their rank order, along with the distribution of panelists' expectations for those issues. These eight items are regarded as problems in the year ahead, but most of them are expected to improve.

The level of interest rates was among the problems most frequently addressed by panelists as an area of particular concern. Many panelists apparently agree with the West Tennessee manufacturer who stated that **interest rates are the key to economic activity. Like a clinical thermometer, they show how sick the patient is.** Other comments follow:

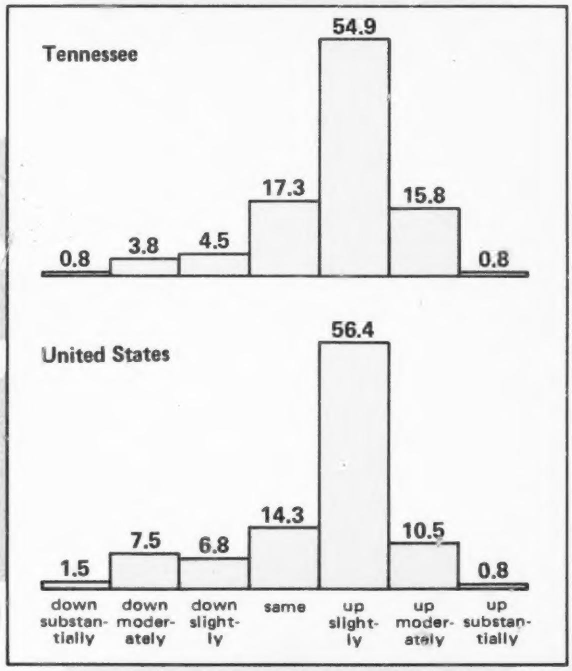
The instability of interest rates, with drastic fluctuations, has worked an extreme hardship on small business and all of those businesses that do not have access to commercial paper financing or alternative sources. Budgeting with any degree of accuracy is impossible and inhibits capital investment and other expansion.

A West Tennessee Banker

High interest rates seem to erode our profits more than anything else and cause more inflation. The answer seems to be to stop all or most contributing items of spending in both business and government that seem to be fueling the inflation. The method of treatment will be painful in the shortfall but will enable us to survive in the long haul.

An East Tennessee Retailer

2 **Comparing 1981 to 1980, 71 percent of the panelists expected Tennessee's economy to be up . . .**



and 67 percent of the panelists expected the U.S. economy to be up.

I feel that high interest rates are the primary cause of the extremely high inflation we have. Interest has become one of our major cost factors in manufacturing. It has made it impossible to build inventories, which cause underutilization of plant capacity in our seasonal business.

A West Tennessee Manufacturer

Lower interest rates are the catalyst to trigger economic activity in housing, industrial construction, autos and banking. Federal spending and deficits continue to crowd other customers out of the capital markets by raising interest rates and spurring inflation.

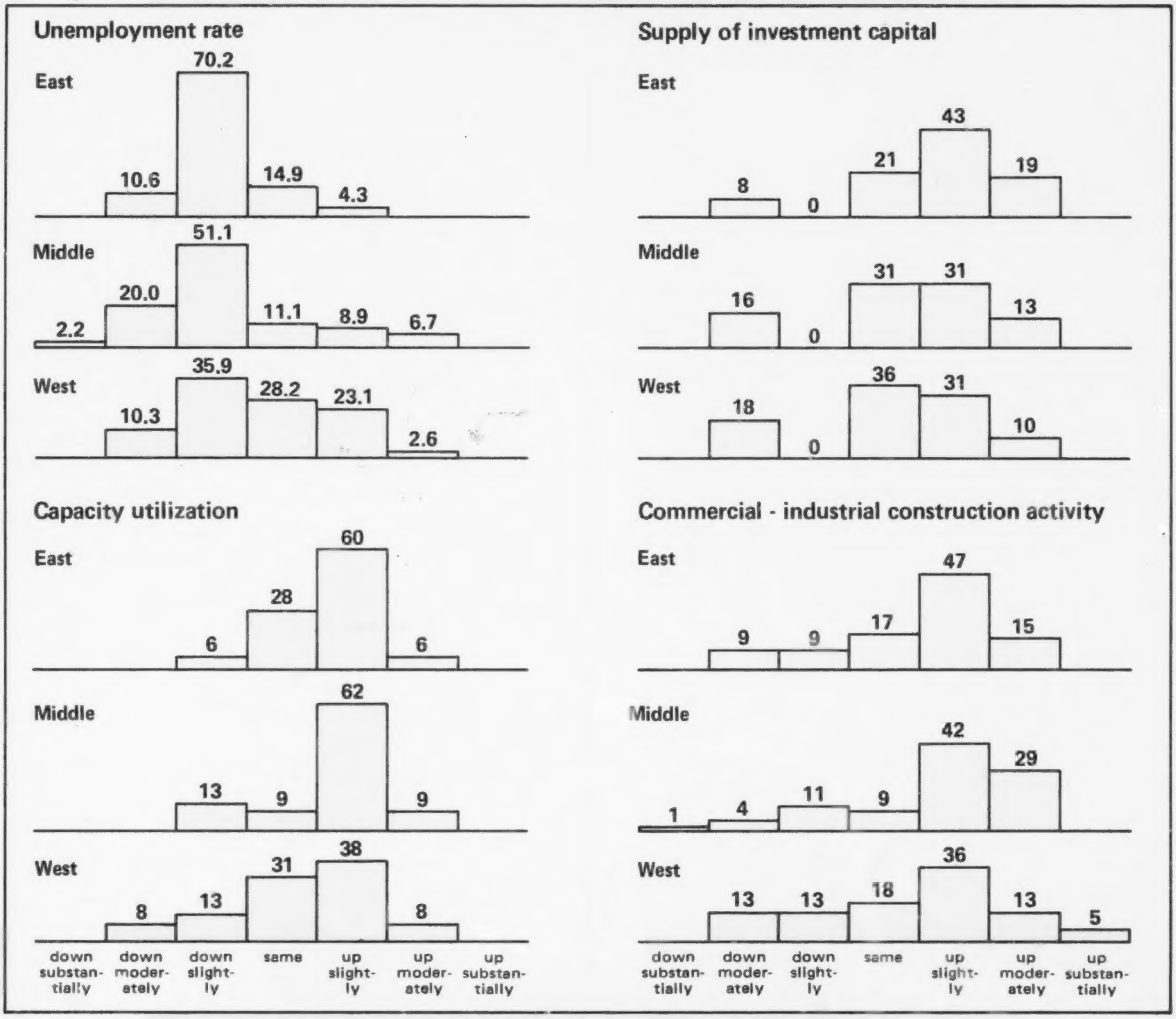
A Middle Tennessee Manufacturer

Tennessee's overall economic outlook for 1981 should outpace the national economy unless interest rates remain extremely high. Under those conditions, Tennessee banks would be unable to compete for funds because of the state's usury ceiling.

A Middle Tennessee Banker

The concerns of interest rates and energy costs are both subsumed in the concern about business costs increasing faster than revenues. One Public Utilities officer said simply, **It is impossible**

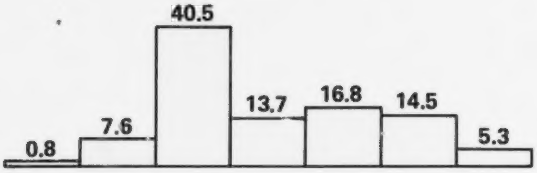
3 For 1981, East and Middle Tennessee are more optimistic with respect to . . .



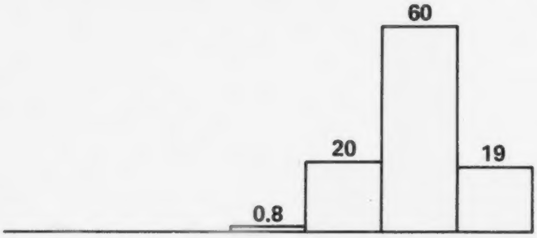
as well as consumer demand and residential construction activity.

4 Ranking of Key Economic Issues in 1981.

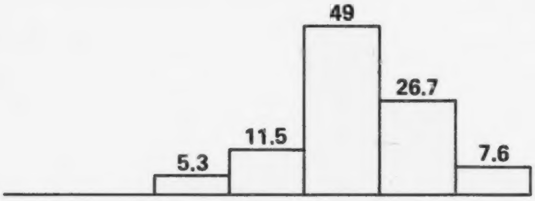
1. Interest rates are a critical problem, though many expect them to go down.



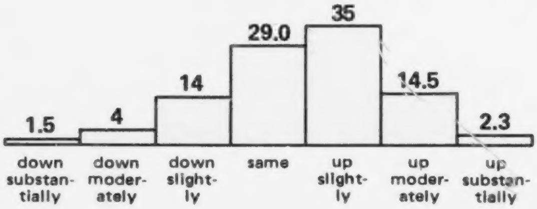
2. Energy costs are a critical problem and they will continue to increase.



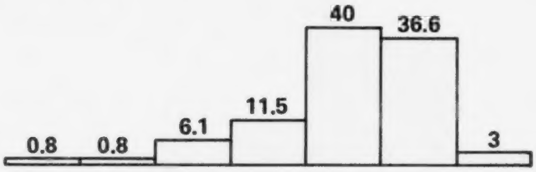
3. Business costs increasing faster than revenues is a key issue again in 1981.



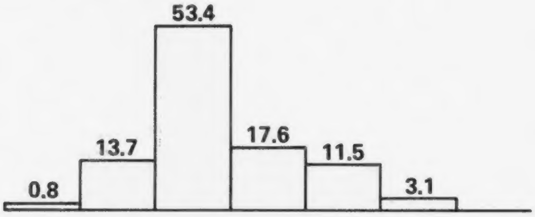
4. The supply of investment capital is a problem, though it should increase in 1981.



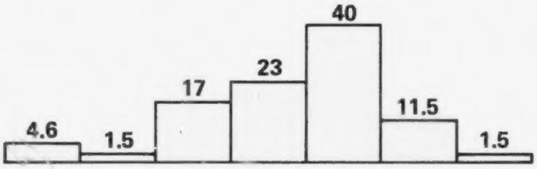
5. Consumer prices in Tennessee are expected to continue their increase.



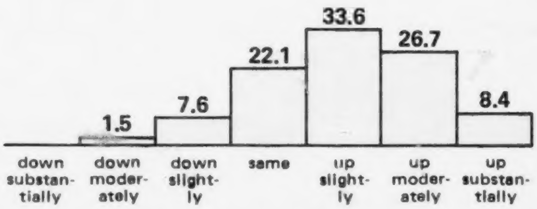
6. Unemployment is perceived as a problem for 1981, though most believe it will decrease slightly.



7. Residential construction activity is a key factor in economic problems, though it may improve in 1981.



8. Demands for wage increase will intensify.



in today's business environment to increase prices as fast as costs, but most of those who commented had specific viewpoints. Among the suggested causes of their worsening position, business people see the decline in productivity, the slowing of receivables in a lagging economy, and the direct costs required to accommodate government regulations. As Figure 5 shows, the trade sector foresees the most difficult position in 1981 in this regard. As one East Tennessee retailer explained:

> **Our industry, retailing, is a low-pay industry. The effect of the new minimum wage will ripple throughout the company. This is expected by our employees whether or not our sales and income increase. Many smaller companies will not be able to survive.**

A Middle Tennessee banker linked the increasing pressures of costs on revenues to another of the key concerns of the panel--the supply of capital. While he did not believe equity or debt instruments would be an increasing source of funds in 1981, he did see possibilities for enabling business to increase the internal generation of funds, saying, **There are two solutions, one short-range and one long-range: tax incentives can provide a stimulus in the near term, but controlling the rate of inflation and restoring a sound economy to this nation is the long-term solution.**

The Energy Issue

Clearly, one of the most difficult problems is that of energy costs. The panelists consider it a problem not only on the national-international level, but also on the state level. The rapidly increasing cost of energy has contributed to the identification of energy costs as the second most pressing issue for 1981. As Figure 6 indicates, 85 percent of the respondents have taken conservation measures as a result of increased prices. If prices continue to increase substantially, 77 percent of the panelists indicated they would take further conservation measures. In the case of electricity costs, it is not only the level, but the structure of rates that may be at issue. In one Survey question, panelists were asked to indicate which of several electric rate structures they would prefer. Figure 7 shows the preferences expressed by the 1981 Panel from the following choices:

(1) Increase prices substantially for heavy users of all types, but leave rates about the same for average users or those who conserve.
(2) Increase prices most for heavy users of all types, but increase rates somewhat for average users and those who conserve.
(3) Increase prices for all users regardless of their usage or efforts to conserve.
(4) Increase heavy industrial and commercial users, leaving residential power rates about the same.
(5) Increase prices for all users at the same rate, but impose an additional lump-sum fee on heavy users.

It is clear that panelists do not believe that any group of users should be exempt from future rate increases. Proposal 4, exempting residential users from rate increases, was the least preferred alternative. Although 28 percent of the respondents chose the mildly variable rate system suggested in proposal 2, 40 percent of the respondents believed that increasing prices for all users, regardless of usage or efforts to conserve, was the most desirable alternative.

Questions concerning the recent policies of TVA and the relative energy-related advantages and disadvantages of Tennessee elicited numerous comments when panelists were asked to address the strengths and weaknesses of the Tennessee economy. Two distinct positions were reflected in those comments. From those who see Tennessee's position as advantageous were these views:

> **Tennessee generally has one of the lowest energy costs, and with the high cost of energy, industry continues to look South (and to Tennessee) to locate.**
>
> **An East Tennessee Manufacturer**

> **The Tennessee energy situation is better than that of the nation as a whole. Tennessee could be a leader in developing its energy resources and set an example for the nation. We do not have to be so dependent on foreign oil.**
>
> **A Middle Tennessee Banker**

> **With some changes in priorities and some push, we can become a major exporter of energy, just like Texas and Louisiana. Our energy exports will be surplus electricity generated by TVA nuclear plants and good old Tennessee coal. . . . We must take some chances to get less expensive energy and slow foreign oil importation.**
>
> **An East Tennessee Utility Executive**

WITH SOME CHANGES IN PRIORITIES AND SOME PUSH, WE CAN BECOME A MAJOR EXPORTER OF ENERGY, JUST LIKE TEXAS AND LOUISIANA.

Those who had reservations about the present course of events are represented by these statements:

I feel the rapid increases in energy are the most critical problem because they are beyond the realm of control of the Tennessee economic community. A strong national energy plan must come forth and strong congressional direction to TVA to run their business as tight as public utilities.

An East Tennessee Manufacturer

Energy cost affects industry not only directly, but also indirectly in the cost of goods and transportation. The staggering increase imposed by TVA will cause industries to look at leaving Tennessee and will act as a deterrent to new energy intensive industries. What good is all the available capacity when few consumers can afford it? The cost of other energy sources, including methane and oil, will also have a negative effect on industrial growth.

A Middle Tennessee Manufacturer

Our energy supply is adequate for expansion. TVA rate increases for "interest" on plants under construction should not be paid for *now* **by** *current* **customers.**

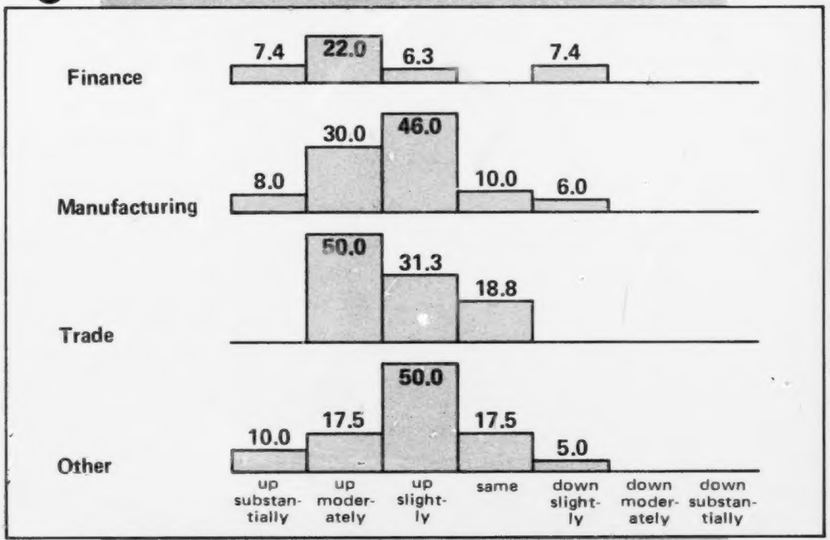
A West Tennessee Manufacturer

TVA's board seems bent on building an unnecessarily high revenue base. In so doing, area rates are increasing at a faster rate than our competition. What to do: (1) persuade or force TVA to follow power industry accounting standards in amortising new plant; (2) allow TVA to coop nuclear facilities with private power companies; (3) tighten management and eliminate duplication and competition within the agency.

A Middle Tennessee Development Official

The energy question, like the other issues panelists identified as key concerns, is not an easy one to resolve. Furthermore, the directions which the

5 **The relationship of costs to revenues . . .**



is a serious problem, especially for the trade sector.

state, its public utilities, and individual economic participants should take cannot be solved merely by adding up the hard facts. There are, as the panelist above suggested, great uncertainties and risks inherent in any choice made. The assessment of risk and gains is a matter that involves judgement and values and is enhanced by the exchange of opinions such as those above.

In weighing our strong points as well as our weak ones, it is often helpful to have the opinion of someone with a different perspective. Perhaps that perspective can be provided by a vice-president of the A. E. Staley Company who addressed the East Tennessee Development District Executive Committee this past October. In discussing their decision to locate a $200 million dollar plant in Loudon County, he observed that "TVA has put a large investment into nuclear power, so there is a gap right now in the cost of power. We think Tennessee will be competitive in the long run, although it may not appear so now. We believe the gap will close in the future." Staley executives believe Tennessee's public and commercial services are not as strong as other places and that airline services are not especially good, but like most of the 1981 Outlook Survey Panelists he saw the state's advantages as outweighing the weaknesses. The state, said the Staley spokesman, "approached this entire consideration in a very professional manner. Tennessee has a very good climate with regard to workers' attitudes. . . . There is a very positive view about new industry. The quality of life is good, with recreational facilites and so forth. And you have a good interstate highway system and relatively good railroads."

Summary

Most of the 1981 Economic Outlook Survey panelists expect Tennessee's economy to improve slightly in 1981 and expect Tennessee to fare better than the United States as a whole. Many panelists see the acquisition of the Nissan and A. E. Staley plants as symbols of Tennessee's commitment to economic growth and of the state's many locational advantages. The national problems of high interest rates, inflation, and energy costs are serious problems in the panelists' view for the country and the state. The Tennessee financial sector, most closely tied to the national course of events, feels less optimistic about 1981 than other economic sectors, and from a geographic point of view, East Tennessee panelists tend to have a more optimistic view than panelists from the western part of the state.

The questions pertaining to energy revealed that nearly all panelists have taken conservation measures and expect to take more in the future. The concern expressed about energy by panelists focus on TVA's costs and development and reveal divergent views as to what energy policies within the state should be. ■

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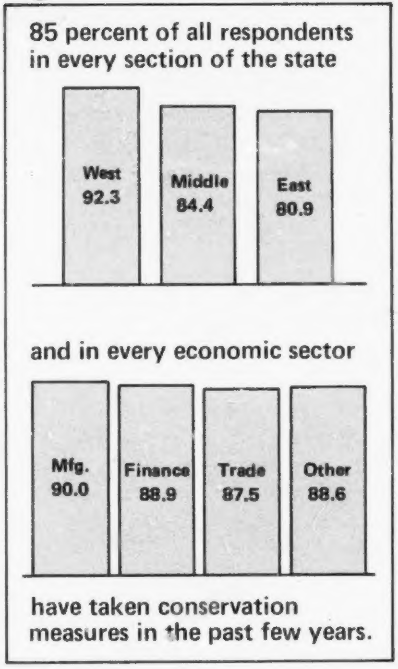
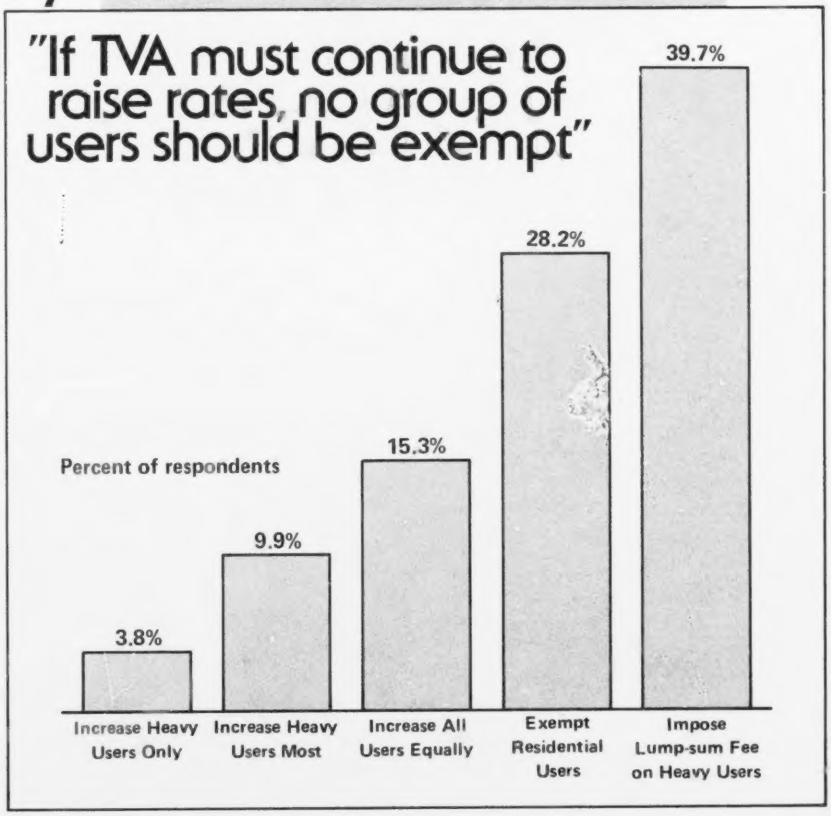
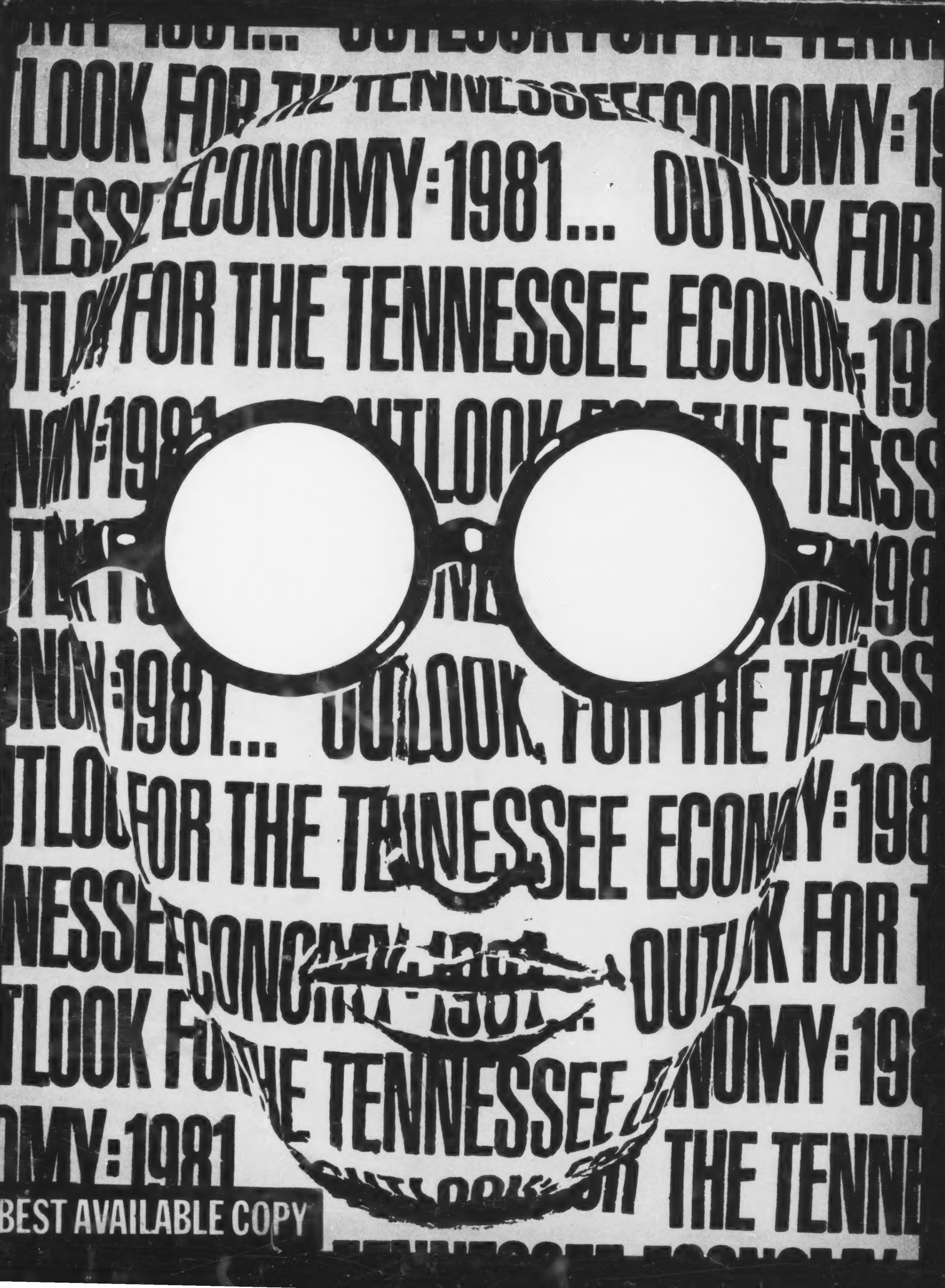


7 Panelist Responses to Rate Increase Alternatives




OUTLOOK FOR THE TENNESSEE ECONOMY: 1981...

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OUTLOOK FOR THE TENNESSEE ECONOMY: 1981

Stephen P. Coelen

The outlook for Tennessee as the state moves into the second year of the decade is for a modest rebound from the 1979-80 economic malaise. Growth in real output in 1981 will be slow, even negative, in the first two quarters and more brisk in the third and fourth quarters. Averaged, the growth will amount to just less than 2 percent, implying strong 4 percent growth in the last half of 1981 and continuing into very early 1982 before settling back into the year's average growth of 3 percent.

Long-term economic growth in the decade will be moderate, roughly in the 2.75 to 3 percent range. This growth is bounded by the sum of the growth in employment and productivity. The major uncertainties in this circumstance are how fast U.S. and Tennessee producers can get productivity back to 1960's and 1950's levels, how much migration into Tennessee of persons eligible for the labor force will continue, and how high the labor force participation rate of second earners in families can go. It depends as well upon the health of the national economy and upon the balance of industries in the nation that are projected to grow the fastest.

Using forecasts of the national economy made by the Wharton Econometric Forecasting Associates, Inc. (WEFA) in November 1980, this year's outlook provides bounds on plausible Tennessee growth. The Tennessee "control" forecast (made in concert with the WEFA "control" forecast) is the most "likely" scenario for Tennessee. Because of the underlying patterns of Tennessee productivity, labor force participation and migration rates, Tennessee "control" growth in real output, overall, was pegged at 2-3/4 to 3 percent. Growth in industry-specific areas fluctuated around this average.

In order to evaluate the remaining impact of differential national growth, alternative "high" and "low" forecasts have been made. These correspond also to WEFA "high" and "low" growth scenarios. Together, the "low," "control," and "high" forecasts show the full range of plausible state growth.

The variables that provide the major indications of strength and weakness of an economy are summarized in Tables 1, 2, and 3. These represent the "control," "low," and "high" growth scenarios, respectively.

As can be seen in the summary columns of these tables, the annual compound growth rates are larger in the 1986 to 1989 period than in 1982 to 1985. This represents a gradual recovery of the economy to the higher growth rates that may be associated with lower inflationary pressures and higher productivity. Similar graphical depiction of the range of growth of the major indicators of the Tennessee economy are shown in Figures 1, 2, and 3. The range of projected variation can be seen to fall between 1.8 and 3.3, at a compound annual rate of growth for real gross state product. The "most-likely" scenario still shows annual growth of 2.7 percent.

The National Forecast

National economic activity declined substantially during 1980. Preliminary forecasts of this decline are suggested to be in the order of -0.7 to -1.0 percent. Following good 3.1 percent growth in the first quarter of 1980, the national economy sagged to a post World War II record 9.9 percent quarterly decline (at annual rates). The year was projected to end with modest growth in the 3rd and 4th quarters.

At press time, the most recent estimate, still preliminary, of the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), is that 1980 fourth quarter national growth was very strong. The BEA estimated fourth quarter growth at 5 percent (seasonally adjusted, annual rate). This represents the year-long decline of only 0.1 percent in real gross national product.

Highlights of the Wharton Econometric Forecasting Associates, Inc. (WEFA) control forecast of November 1980 suggest national real output growth in the 1980's of more than 3 percent. This represents a decrease by about 1 percent in the growth anticipated for the 1980's. The diminution of

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this growth was spurred, as Professor Lawrence Klein (long associated with WEFA) said in acceptance of his Nobel prize in economics this fall, by a reappraisal of productivity problems, investment, and resource shortages. Still, the short- and long-term **national** scenarios of WEFA may be slightly optimistic. The recovery of productivity in national industries projected by our underlying WEFA forecast suggests a rapid rebound to growth reminiscent of the 1960's. This may be optimistic. The projections for the control, low- and high-growth national forecasts of productivity by WEFA are shown in Figure 4.

The national forecasts in Figures 5-7 represent projections of Chase Econometric Associates, Inc. (CHASE), Data Resources, Inc. (DRI), The Conference Board (CB), and WEFA. Especially in Figure 5, where the WEFA forecast is the upper bound on optimism of GNP growth, but also in the WEFA low deflator growth scenario in Figure 6 and the relatively low unemployment rate scenario in Figure 7, WEFA shows optimistic attitudes about the economy.

These comparisons suggest a modest growth decade in the 1980's. Our judgment this year of the national

TABLE 1

TENNESSEE SELECTED INDICATORS
(Control Growth Scenario)

	Forecast Data										Annual Compound Rates of Growth	
Description	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1982-85	1986-89
Tennessee Gross State Product (Millions of dollars)	47,087.	51,972.	57,406.	63,356.	69,458.	75,843.	83,447.	91,776.	100,799.	110,683.	9.7	9.9
Percentage Change	8.26	10.37	10.46	10.36	9.63	9.19	10.03	9.98	9.83	9.81		
Tennessee Gross State Product (Millions of 1972 dollars)	26,703.5	27,220.8	28,028.1	28,785.0	29,508.3	30,231.6	31,099.7	31,954.0	32,843.9	33,807.2	2.5	2.8
Percentage Change	-0.62	1.94	2.97	2.70	2.51	2.45	2.87	2.75	2.78	2.93		
Tennessee Personal Income (Millions of dollars)	34,827.	38,546.	42,634.	47,254.	51,924.	57,375.	63,394.	70,113.	77,358.	85,599.	10.4	10.5
Percentage Change	8.29	10.68	10.61	10.84	9.88	10.50	10.49	10.60	10.33	10.65		
Tennessee Personal Income (Millions of 1972 dollars)	19,323.6	19,603.4	20,025.4	20,555.1	21,223.7	21,888.1	22,552.8	23,221.8	23,981.9	24,877.0	3.0	3.3
Percentage Change	-1.89	1.45	2.15	2.65	3.25	3.13	3.04	2.97	3.27	3.73		
Tennessee Employed Persons (Thousands)	1,862.4	1,884.6	1,909.7	1,931.3	1,952.1	1,974.5	2,000.5	2,027.3	2,053.6	2,079.6	1.1	1.3
Percentage Change	-0.14	1.19	1.33	1.13	1.08	1.15	1.32	1.34	1.30	1.27		
Tennessee Unemployment Rate	7.2	7.1	6.8	6.4	6.3	6.5	6.3	6.3	6.2	6.1		
Implicit Deflator, GSP	176.3	190.9	204.8	220.1	235.4	250.9	268.3	287.2	306.9	327.4	7.0	6.9
Percentage Change	8.94	8.28	7.28	7.46	6.94	6.58	6.96	7.04	6.86	6.68		
Tennessee Manufacturing Output/Employee (Thousands of 1972 dollars)	18.3	18.5	18.8	19.2	19.5	19.8	20.2	20.5	20.9	21.3	1.7	1.8
Percentage Change	-0.61	1.17	1.87	1.94	1.70	1.24	1.98	1.79	1.96	1.94		
Tennessee Per Capita Income (Dollars)	7,853.	8,571.	9,367.	10,255.	11,146.	12,146.	13,244.	14,461.	15,784.	17,311.	9.0	9.3
Percentage Change	6.95	9.13	9.29	9.48	8.68	8.98	9.04	9.19	9.15	9.67		
Tennessee Population (Thousands)	4,435.	4,498.	4,552.	4,608.	4,659.	4,724.	4,787.	4,848.	4,901.	4,945.	1.2	1.1
Percentage Change	1.25	1.42	1.21	1.24	1.10	1.40	1.33	1.29	1.09	0.89		

Source: Tennessee Econometric Model, Center for Business and Economic Research, The University of Tennessee, Knoxville, Tennessee.

economy reflects a different, real expectation of 2.5-2.75 percent long-run real GNP growth over the decade. This lower growth is in contrast to the somewhat more optimistic picture painted by WEFA of 3.14 percent average annual growth from 1981 to 1989. The Tennessee real GSP forecast in Table 1 does outstrip this lower anticipated national growth by a small increment. We believe that in the 1980's Tennessee will continue to grow faster than the U.S. (as it did during the last decade), but the amount by which Tennessee exceeds the U.S. growth will shrink somewhat.

The Future of the National Economy

The national outlook depends most heavily on two factors, interest rates and inventories. Yet, the greatest uncertainty comes from the change of administrations in Washington. Reagan campaign promises of taxes and spending cuts have not yet been introduced to Congress, whose political leadership has been altered. The time profile of the Reagan-supported Kemp-Roth personal tax cut proposal has not been tested to determine whether second- and third-year 10 percent cuts will in fact be implemented in the face of the econo-

TABLE 2

TENNESSEE SELECTED INDICATORS

(Low Growth Scenario)

	Forecast Data										Annual Compound Rates of Growth	
Description	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1982-85	1986-89
Tennessee Gross State Product (Millions of dollars)	47,083.	51,657.	56,982.	62,835.	68,405.	74,812.	82,168.	90,160.	98,090.	107,506.	9.5	9.4
Percentage Change	8.25	9.72	10.31	10.27	8.87	9.37	9.83	9.73	8.79	9.60		
Tennessee Gross State Product (Millions of 1972 dollars)	26,705.3	27,039.7	27,754.4	28,427.7	28,889.6	29,283.0	29,770.2	30,264.6	30,796.3	31,346.7	1.8	1.7
Percentage Change	-0.61	1.25	2.64	2.43	1.62	1.36	1.66	1.66	1.76	1.79		
Tennessee Personal Income (Millions of dollars)	34,827.	37,938.	42,418.	46,957.	51,533.	56,940.	62,908.	69,451.	76,410.	84,143.	10.3	10.2
Percentage Change	8.29	8.93	11.81	10.70	9.74	10.49	10.48	10.40	10.02	10.12		
Tennessee Personal Income (Millions of 1972 dollars)	19,327.0	19,287.1	19,895.7	20,460.5	20,922.7	21,349.9	21,767.6	22,203.2	22,741.0	23,385.9	2.4	2.4
Percentage Change	-1.87	-0.21	3.15	2.84	2.26	2.04	1.96	2.00	2.42	2.84		
Tennessee Employed Persons (Thousands)	1,862.4	1,895.4	1,909.4	1,927.0	1,941.3	1,954.8	1,970.2	1,986.3	2,002.3	2,016.1	0.8	0.8
Percentage Change	-0.14	1.77	0.73	0.92	0.74	0.69	0.79	0.82	0.80	0.69		
Tennessee Unemployment Rate	7.2	7.0	7.0	6.7	6.6	6.8	6.7	6.6	6.5	6.4		
Implicit Deflator, GSP	176.3	191.0	205.3	221.0	236.8	255.5	276.0	297.9	318.5	343.0	7.6	7.5
Percentage Change	8.92	8.36	7.47	7.66	7.13	7.90	8.04	7.93	6.92	7.68		
Tennessee Manufacturing Output/Employee (Thousands of 1972 dollars)	18.3	18.0	18.4	18.8	19.0	19.1	19.3	19.5	19.7	19.9	1.3	1.0
Percentage Change	-0.61	-1.75	2.61	1.75	1.23	0.52	1.10	0.97	1.19	1.17		
Tennessee Per Capita Income (Dollars)	7,854.	8,411.	9,306.	10,177.	11,057.	12,069.	13,188.	14,408.	15,718.	17,203.	9.1	9.3
Percentage Change	6.95	7.10	10.64	9.36	8.65	9.1	9.27	9.25	9.09	9.45		
Tennessee Population (Thousands)	4,435.	4,510.	4,558.	4,614.	4,660.	4,718.	4,770.	4,820.	4,861.	4,891.	1.2	0.8
Percentage Change	1.25	1.71	1.06	1.22	1.01	1.23	1.11	1.05	0.85	0.62		

Source: Tennessee Econometric Model, Center for Business and Economic Research, The University of Tennessee, Knoxville, Tennessee.

mic reality brought on by the first cut. Even the extent of the 1981 cut is uncertain. Reagan has supported the accelerated depreciation plan of Senator Lloyd Bentsen (2-4-7-10) which will reduce existing tax life of physical assets by 53 percent on average. This, already introduced in Congress, seems likely to be passed in a form not too substantially different from the original proposal. Reagan will direct a re-emphasis of spending. Defense spending is projected to grow in real terms at 5 percent and higher rates and nondefense at rates less than 1 percent through the 1980's. This will not have the same stimulative effect in Tennessee that the reverse might, but the magnitude of the impacts are impossible to predict without significantly more data.

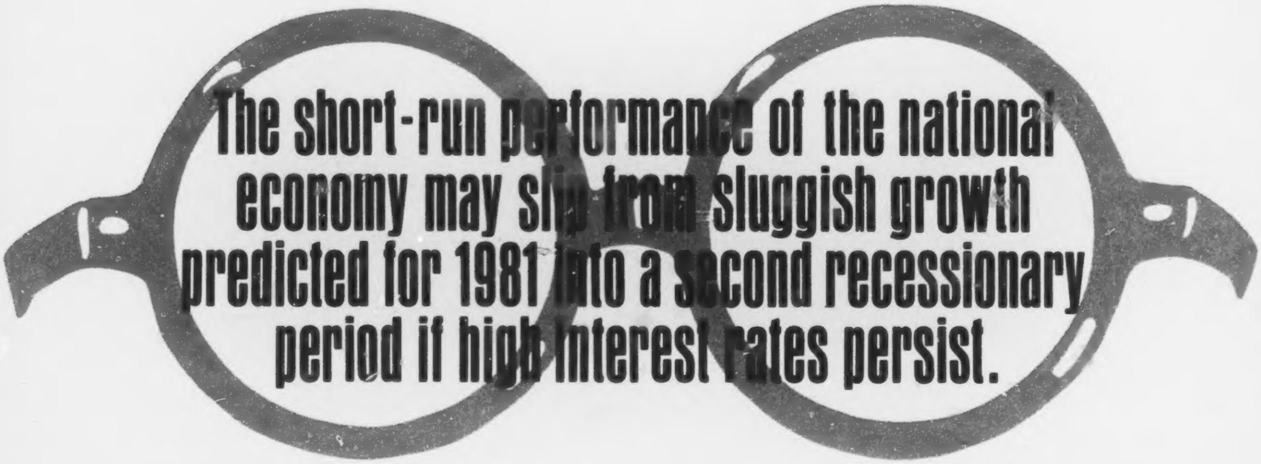
The short-run performance of the national economy may slip from sluggish growth predicted for 1981 into a second recessionary period (a double-dip) if high interest rates persist. Led by the prime, which has reached record rates of over 21 percent, there is little reliable prediction of the direction in which these rates will move. Continuation of the record high rates will depress housing, automobile, and other large-ticket durables enough to slow overall demand. This might push

TABLE 3

TENNESSEE SELECTED INDICATORS
(High Growth Scenario)

	Forecast Data										Annual Compound Rates of Growth	
Description	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1982-85	1986-89
Tennessee Gross State Product (Millions of dollars)	47,083.	51,914.	57,891.	64,217.	70,353.	77,413.	85,349.	94,834.	104,634.	115,426.	10.2	10.6
Percentage Change	8.25	10.26	11.51	10.93	9.56	10.04	10.25	11.11	10.33	10.31		
Tennessee Gross State Product (Millions of 1972 dollars)	26,705.3	27,219.4	28,355.0	29,338.5	30,196.0	31,066.6	32,054.9	33,339.1	34,501.5	35,720.5	3.1	3.7
Percentage Change	-0.61	1.92	4.17	3.47	2.92	2.88	3.18	4.01	3.49	3.53		
Tennessee Personal Income (Millions of dollars)	34,827.	37,870.	42,356.	47,006.	51,614.	57,082.	63,003.	69,844.	77,149.	85,429.	10.5	10.7
Percentage Change	8.29	8.74	11.85	10.98	9.80	10.59	10.37	10.86	10.46	10.72		
Tennessee Personal Income (Millions of 1972 dollars)	19,327.1	19,282.2	19,941.7	20,544.4	21,214.3	21,912.5	22,589.8	23,343.7	24,176.9	25,123.6	3.2	3.6
Percentage Change	-1.87	-0.23	3.42	3.02	3.26	3.29	3.09	3.34	3.57	3.92		
Tennessee Employed Persons (Thousands)	1,862.4	1,898.3	1,921.5	1,946.9	1,970.9	1,997.9	2,028.6	2,064.0	2,099.8	2,133.5	1.3	1.7
Percentage Change	-0.14	1.93	1.23	1.32	1.23	1.37	1.53	1.74	1.74	1.60		
Tennessee Unemployment Rate	7.2	6.9	6.4	6.0	6.0	6.3	6.3	6.0	6.0	5.9		
Implicit Deflator, GSP	176.3	190.7	204.2	218.9	233.0	249.2	266.3	284.5	303.3	323.1	6.9	6.7
Percentage Change	8.92	8.18	7.05	7.21	6.44	6.95	6.85	6.83	6.62	6.55		
Tennessee Manufacturing Output/Employee (Thousands of 1972 dollars)	18.3	18.1	18.9	19.5	19.9	20.2	20.6	21.3	21.7	22.3	2.2	2.7
Percentage Change	-0.61	-0.92	4.37	3.11	2.33	1.49	1.99	3.07	2.16	2.42		
Tennessee Per Capita Income (Dollars)	7,853.	8,397.	9,304.	10,201.	11,077.	12,063.	13,110.	14,338.	15,636.	17,127.	9.0	9.3
Percentage Change	6.95	6.92	10.79	9.65	8.58	8.90	8.68	9.36	9.06	9.54		
Tennessee Population (Thousands)	4,435.	4,510.	4,553.	4,608.	4,660.	4,732.	4,806.	4,871.	4,934.	4,987.	1.3	1.2
Percentage Change	1.25	1.70	0.95	1.21	1.12	1.56	1.55	1.37	1.28	1.08		

Source: Tennessee Econometric Model, Center for Business and Economic Research, The University of Tennessee, Knoxville, Tennessee.



The short-run performance of the national economy may slip from sluggish growth predicted for 1981 into a second recessionary period if high interest rates persist.

the economy into another tailspin. The nearly immediate effects of the peaking of interest rates in mid-April on second quarter output are testimony to the seriousness of this possibility. However, if interest rates remain high now for a period as short in duration as the earlier experience, it is unlikely that output would fall as rapidly as the second quarter (1980) 9.9 percent decline in real GNP. This is because inventories have been reduced since that time and are now continuing at very low levels.

Interest rate policies of the Federal Reserve (FED), were altered by the policy revision of October 6, 1979. As a result of the policy, the Federal Reserve intends that (1) monetary policy will be applied over all periods, not just during economic downturns; and (2) the new focus of monetary policy will be on banking system reserves rather than on interest rates (specifically the federal funds rate). Overall, the move on October 6 contained three specific provisions:

- Raising of the discount rate from 12 to 13 percent
- Requiring an 8 percent marginal reserve on "managed liabilities," such as Edge Act Corporations, U.S. agencies and foreign branch banks (including time deposits, Eurodollar borrowings and federal funds borrowing)
- Enforcing policy with a trigger on reserves rather than on the federal funds rate.

Last year's national forecasts projected that control of the money supply growth would cause the prime to fall reasonably smoothly from the then-record 16 percent to less than 12 percent (in 1980) and to less than 10 percent (in 1981). No one seems to be so optimistic this time around.

It is easy to see the approximate causes of high interest rates. Figure 8 plots series of data on the money stock (M1-B: currency, coin and basic checkable deposits) with yields of selected securities. Data on this material, compiled from reports of the St. Louis Federal Reserve Bank, are combined in figures in the upper panel, with banks announced by the FED around acceptable levels of money supply. Until February 1980, growth fell within the acceptable band. Following that, however, from February through April, the money supply was actually reduced. This produced the early 1980 interest rate highs in which the prime reached 20 percent for the first time. With this scare, and perhaps with other election-year political events, the money supply was loosened through August and even into September until it again exceeded desired levels. Slowing the growth in supply has produced the rising rates experienced since August. Smoother future interest rates are desirable, but they will require more sophisticated control of the supply of money than the FED has so far indicated that it has.

In assessing the outlook, some thoughts presented in the 1980 **Economic Report to the Governor of the State of Tennessee** seem to continue to be valid:

> The Federal Reserve Bank's policy must be two-pronged. First it will reduce M1 to raise interest rates to such extremes that investors take seriously a change in federal government policies which historically have seemed more interested in unemployment policies than anti-inflationary policies. If prong one does not work, the FED will drop back only slightly but maintain high rates for as

FIGURE 1

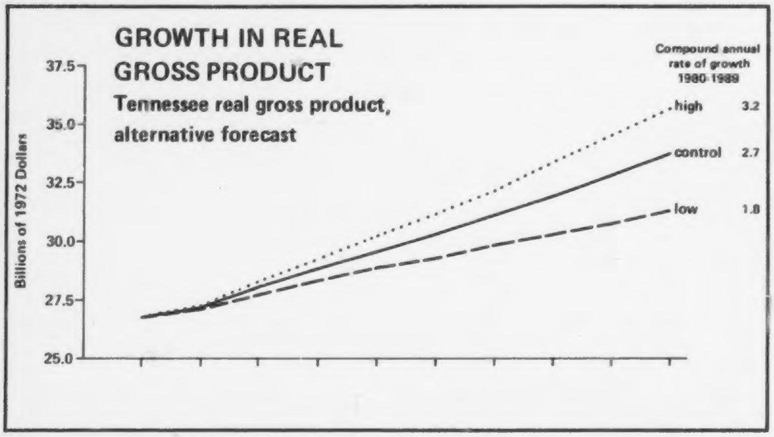
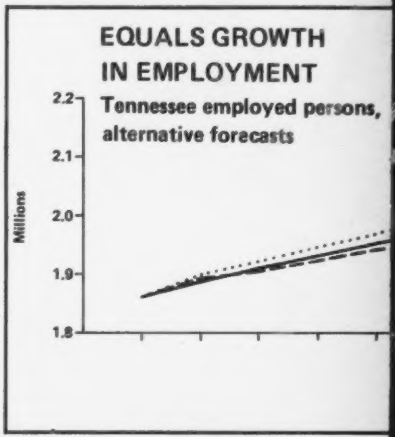


FIGURE 2



> prolonged a period as necessary to make investors take the new policies seriously. The Economic Report's forecast is a subscriber to the national perspective that sustained high interest rates will be required. This will forestall an immediate long-term decline in interest rates. . . . Eventually the rates will begin to fall and with them the rate of inflation. Simultaneously, the real growth rate will be pushed in the other direction, upward.

The anticipation and hope of this year's outlook is for some stable but intermediate interest rates.

High interest rates should not have an absolutely debilitating effect on the economy. They alone will not push the economy into a double-dip because inventory adjustments have already occurred. Recent inventory/ sales ratios of manufacturing and trade inventories combined, of durable and nondurable goods inventories, are depicted in Figure 9. The newest data available, through November 1980, have been added to the manufacturing and trade series. Inventories are below 1.4 months of sales, a number as low as any in the recent downturn, and nearly equal to the 1.38 months of inventories experienced coming into the recession, except for early 1979 when the level was lower than any in the past six years.

Rapid divestment of inventories, compared to the slower rates experienced in the 1973-75 recession, is an indicator that the economy is prepared to withstand a slow growth period. With low inventories, the economy can live "from hand to mouth." Lower demand may then imply slower production rates, but little demand can be drawn from inventories if they are not there. Automobiles currently represent the major exception, having high inventories at both dealers and producers. Continuing low growth will have a magnified effect on auto production. Ramifications will be felt through the economy. By and large, however, the low inventory position will likely cushion or prevent a double-dip.

The long-run national economy's distribution of future real output growth by industry has dramatic effects on Tennessee. Listed in order of highest to lowest growth in the national manufacturing industries over the 1982-89 period, the WEFA forecast gives the following ranks to industries as listed below.

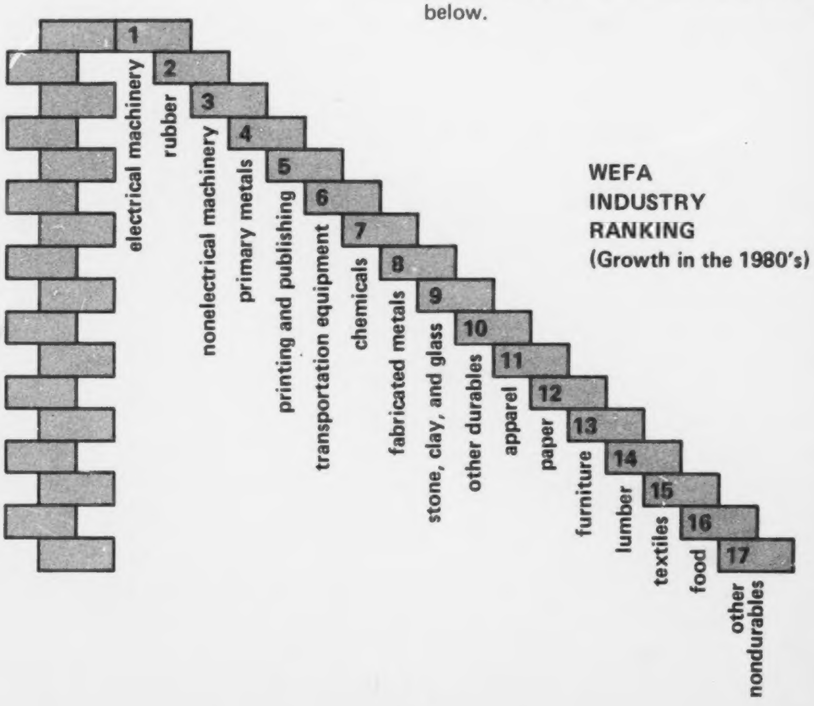
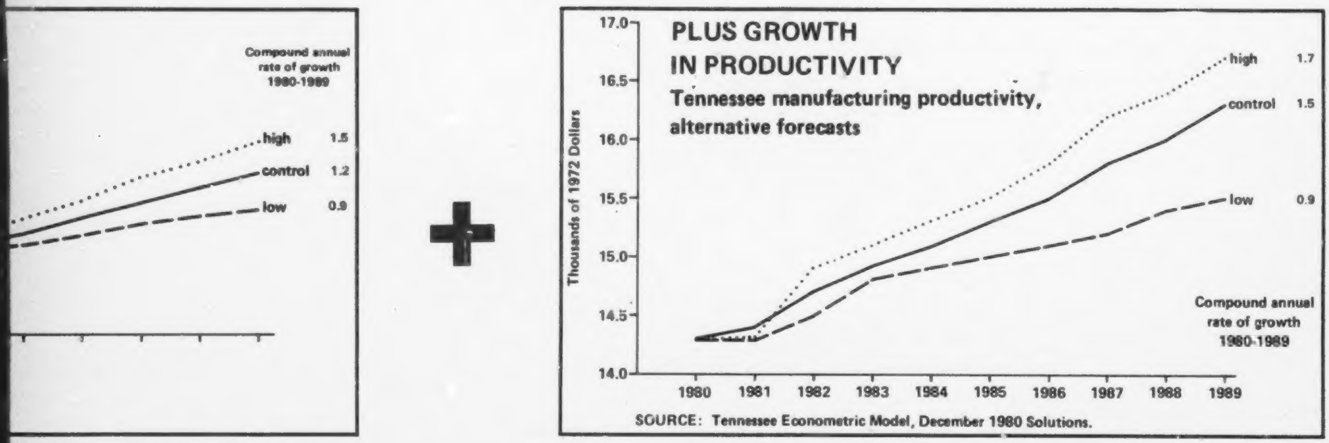

WEFA INDUSTRY RANKING (Growth in the 1980's)
1 electrical machinery
2 rubber
3 nonelectrical machinery
4 primary metals
5 printing and publishing
6 transportation equipment
7 chemicals
8 fabricated metals
9 stone, clay, and glass
10 other durables
11 apparel
12 paper
13 furniture
14 lumber
15 textiles
16 food
17 other nondurables

FIGURE 3



PLUS GROWTH IN PRODUCTIVITY

Tennessee manufacturing productivity, alternative forecasts

SOURCE: Tennessee Econometric Model, December 1980 Solutions.

The balance in the national economy implied by this ranking does indeed reflect in this year's Tennessee outlook. Relative industrial growth influences the extent to which Tennessee can share in projected national growth as well as the direction of future Tennessee diversity.

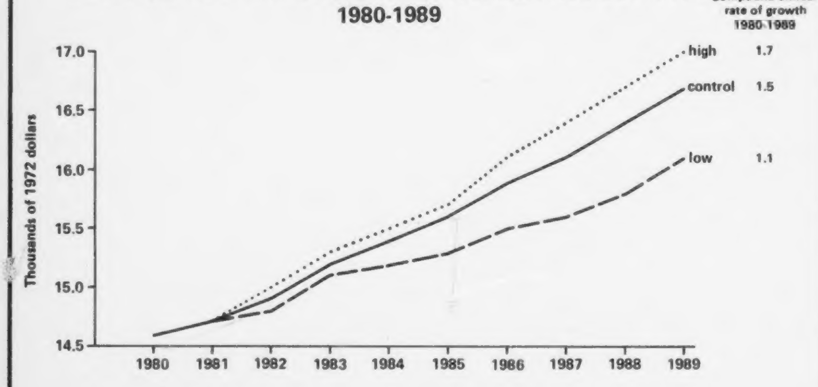
Significant Features of the Tennessee Economic Forecast

- **Short Run.** The Tennessee economy has come through a difficult year. Preliminary indications for 1980, based on early information about employment (but without details about the surprising growth in fourth quarter 1980), suggest a decline of real GSP by perhaps as much as -0.6 percent. For the downturn's severity (predicted last year as -.01 percent growth), Tennessee's downturn may well show itself to be less severe than the national downturn. If this is the case, it would be in direct contrast to a report of the U.S. Bureau of Economic Analysis (BEA) that Tennessee is more cyclically sensitive than the U.S.

With a negative year in 1980, a 1981 rebound that would have greater intensity than long-term average growth might be expected. However, this is not forecast, because continuation of high interest rates will minimize the rebound. There will be two early quarters of near zero real growth in 1981. These, followed by later quarters of positive growth, will average to about 2 percent, less than strong growth for the entire calendar year. Even 1982 will fail to bring a strong rebound, with growth equal to about 3 percent. This is because the extended shallow downturns will tend only to melt away without notice.

FIGURE 4

ALTERNATIVE FORECASTS OF NATIONAL PRODUCTIVITY 1980-1989



SOURCE: Wharton Econometric Forecasting Associates, December 1980.

- **Long Run.** After 1981, basic steady-state real growth settles into the forecast. The only break occurs during the modest slowdown in 1985. The latter is consistent with a national slowdown shown in the Wharton forecast, a reflection of overbuilding in the housing industry in the 1982-84 period and of the natural gas deregulation in 1985. The major impacts of the 1985 downturn show up in construction; stone, clay, and glass; lumber and wood products; primary metals; and some other durables and construction-oriented industries.

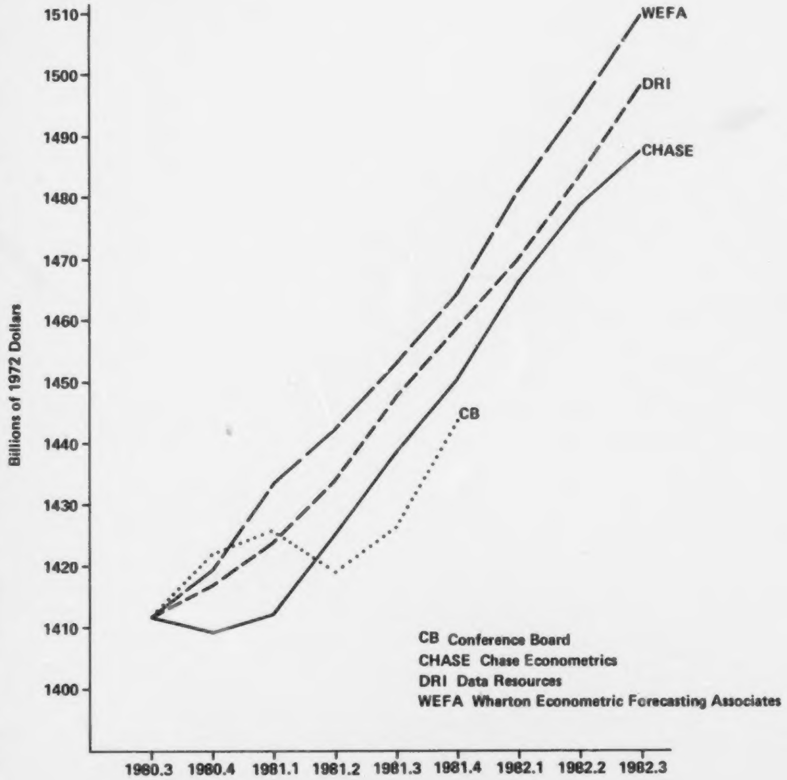
- **Productivity.** In the development of this forecast for Tennessee, a most significant variable was the factor of productivity over time. In many regards this has been the crucial element leading to a sluggish economy since the 1960's. Many economists believe that productivity declines are a function of international energy dependence and demographic change and that there will be a natural recovery in productivity during the 1980's. The current outlook forecasts some natural recovery in productivity. As Table 1 suggests, Tennessee manufacturing productivity will grow at 2 percent per year in real terms through the 1980 decade. This can be contrasted with growth in national manufacturing productivity, forecast occasionally at an annual rate of more than 3 percent. Productivity growth in manufacturing is higher than total productivity growth in all industries. Because the state's concentration in manufacturing pulls up the average growth rate in all industries, Tennessee total productivity growth is projected in the next decade at about 1½ percent. This is low, but still nearly twice the average of the slow-growth 1970's.

- **Population.** The Tennessee forecast shows significantly more population growth in the 1980's than was forecast last year. Increases in this

ALTERNATIVE NATIONAL

FIGURE 5

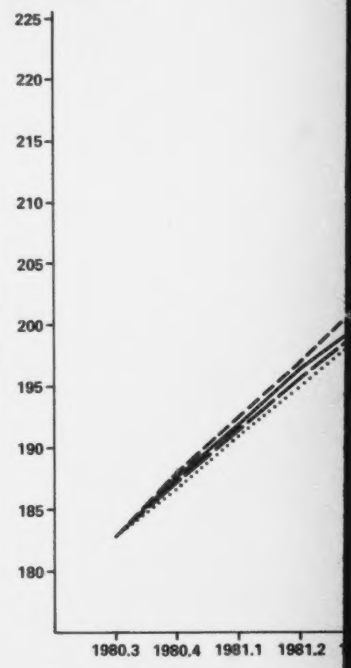
QUARTERLY GNP ECONOMIC FORECASTS (October 1980)



SOURCE: Conference Board, *Statistical Bulletin*, Volume 13, No. 11, November 1980.

FIGURE 6

QUARTERLY GNP DEFLATOR INDEX FORECASTS (October 1980)



SOURCE: Conference Board, *Statistical Bulletin*, Volume 13, No. 11, November 1980.

long-term forecast are due to new preliminary information from the Census on the population growth in the state. This year's forecast of annual compound population growth in the 1980's is 1.22 percent, compared to last year's estimates over the same forecast period of 0.79 percent.

New estimates of the growth in population, however, have not added significantly to our estimates of employment growth. Last year's forecast suggested employment growth of 1.27 percent per annum in the 1980's. This year's forecast is virtually unchanged, at 1.23 percent per annum. The obvious difference, given the differing population forecasts, is that last year's outlook implied that nearly 1 out of every 2 new entrants into the labor force was from a population subgroup not already in the market--women previously working at home, younger-aged entrants to the labor force, older workers pushing back their retirement, etc. Much of the growth that could come from this "fringe" labor force has already occurred in the 1970's and the new outlook has downplayed this growth. Increases in employment will come

QUARTERLY FORECASTS

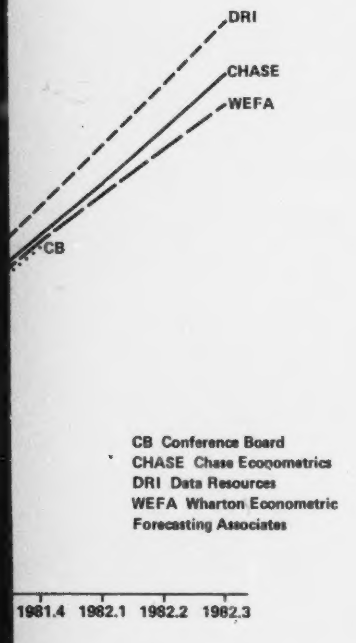
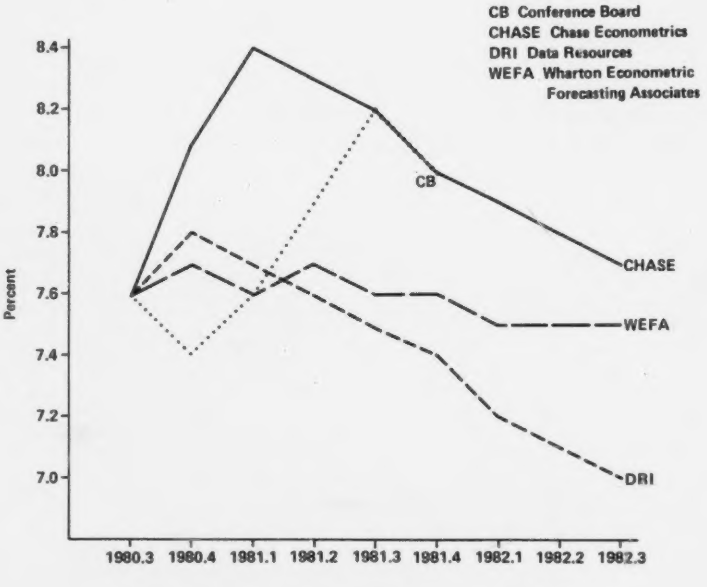


FIGURE 7

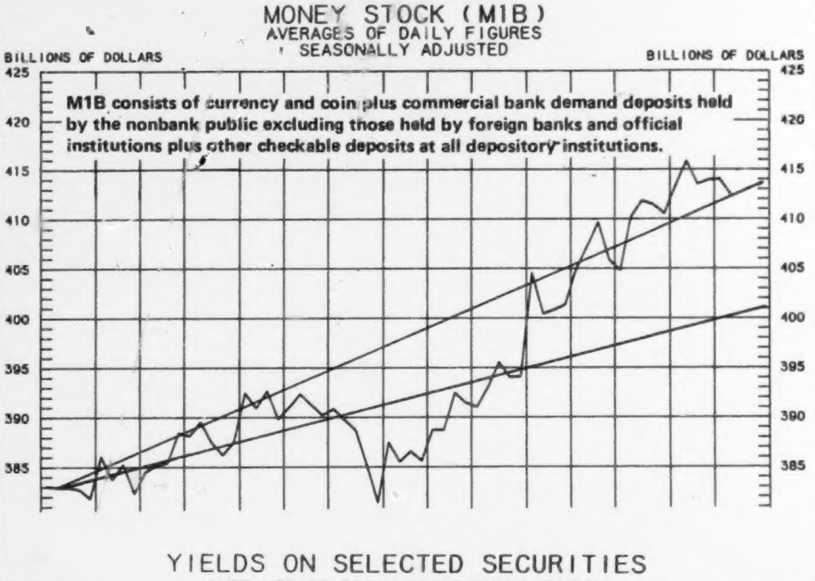
QUARTERLY NATIONAL UNEMPLOYMENT RATE FORECASTS (October 1980)



SOURCE: Conference Board, *Statistical Bulletin*, Volume 13, No. 11, November 1980.

BEST ESTIMATES PEG THE GROWTH IN REAL OUTPUT AT 3 PERCENT RATHER THAN AT RATES OF 4 PERCENT, WHICH WE HAVE PREVIOUSLY EXPERIENCED.

FIGURE 8


MONEY STOCK (M1B)
AVERAGES OF DAILY FIGURES
SEASONALLY ADJUSTED

M1B consists of currency and coin plus commercial bank demand deposits held by the nonbank public excluding those held by foreign banks and official institutions plus other checkable deposits at all depository institutions.

YIELDS ON SELECTED SECURITIES
AVERAGES OF DAILY RATES ENDED FRIDAY

LATEST DATA PLOTTED ARE AVERAGES OF RATES AVAILABLE FOR THE WEEK ENDING: DECEMBER 19, 1980

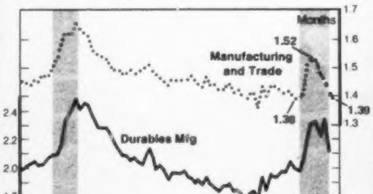
SOURCE: Compiled from material of Federal Reserve Bank of St. Louis.

from traditional areas--new migration and the expected entrance of workers into the labor force at traditional ages as the current population matures.

- **Summary.** In summary, the 1980's will be a moderate growth period in Tennessee and the nation. It will depend heavily upon reaching stability of prices in the national economy. It will also depend upon achieving a measure of independence from the resource shortages in energy, balance in international payments in trade, and growth in savings and investment. Buildup in the 1980's will come slowly, without the significant rebound that customarily follows a downturn.

Productivity and employment growth will be the limiting forces in the economy. Much will depend upon the response of interest rates to the actions of the Federal Reserve Bank. Best estimates peg the growth in real output at 3 percent rather than at rates of 4 percent, which we have previously experienced. ■

FIGURE 9
Inventory-Sales Ratios



SOURCE: Conference Board, *Statistical Bulletin*, Volume 13, No. 11, November 1980. Data added for September, October, and November from reports of Department of Commerce.

TENNESSEE GRAPHICS

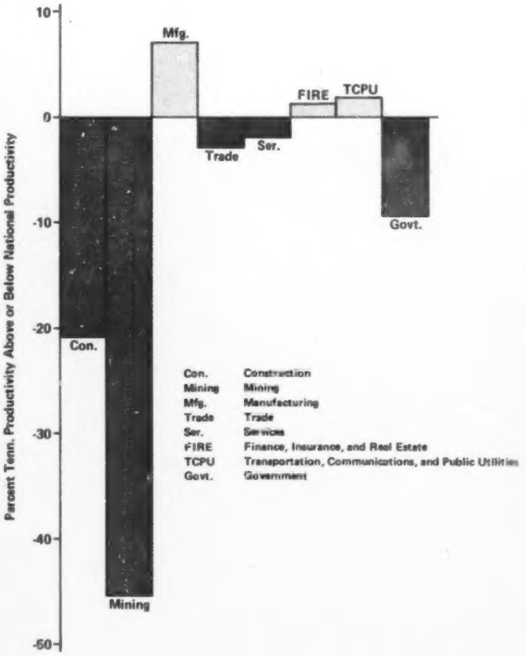
economic analysis in chart form*

FIGURE 1

PRODUCTIVITY IN TENNESSEE RELATIVE TO NATIONAL PRODUCTIVITY MAJOR INDUSTRIAL CATEGORIES

(Output in Nominal Dollars)

1979



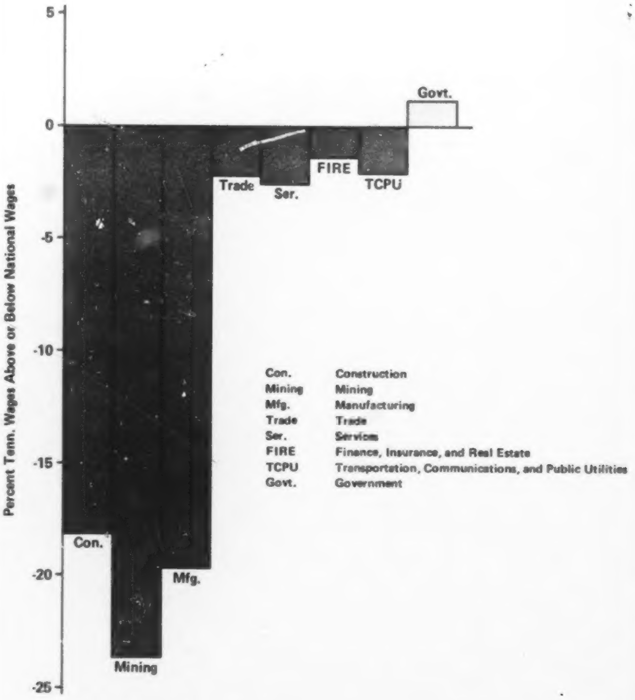
SOURCE: Tennessee Econometric Model, historical data.

FIGURE 2

TENNESSEE WAGES RELATIVE TO NATIONAL WAGES MAJOR INDUSTRIAL CATEGORIES

(Wages in Nominal Dollars)

1979



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, unpublished data, August 1980, and Tennessee Econometric Model, historical data.

*A periodic feature of the *Survey of Business*.

Tennessee Economic Sector Activity In The 1980's

William F. Fox
Glen E. Schuler, Jr.

A small economic rebound in 1981, followed by a stronger rebound in 1982, is the current economic outlook. The remainder of the 1980's will be a moderate growth decade. In this context, significant variation in activity among the different economic sectors can be expected. This article summarizes some of the important forecasted economic trends for the 1980's for each of the following sectors: manufacturing; finance, insurance, and real estate; transportation, communications, and public utilities; trade; services; mining; contract construction; state and local government; energy; agriculture; and population.

Manufacturing

Manufacturing remains the largest Tennessee industry in both employment and output. In 1980, over 35 percent of real output and over 29 percent of nonagricultural employment were located in the manufacturing sector. Tennessee is significantly above average in manufacturing activity, as the nation employs 22 percent of its labor force in manufacturing and derives 24 percent of its output from manufacturing.

Surprisingly, while Tennessee has a slightly higher percentage of its output coming from durable goods than the nation, it has a lower percentage of durable goods employment than the nation (12.7 percent to 13.2 percent). Tennessee's concentration falls primarily in the nondurable goods industries. Major nondurables industries include apparel, chemicals, and food. The largest durable goods industries are electrical machinery, nonelectrical machinery, and fabricated metal products.

Since the manufacturing industries export much of their output to consumers outside the state, manufacturing is more responsive to national business cycles than are nonmanufacturing industries. The latter industries often sell more of their outputs to customers within the state. The durables manufacturing industries, together with the construction industry, are primarily responsible for transmitting the 1980 national recession into Tennessee as national demand fell. All of the Tennessee durable manufacturing industries displayed negative growth in real output in 1980.[1] Furniture showed the largest

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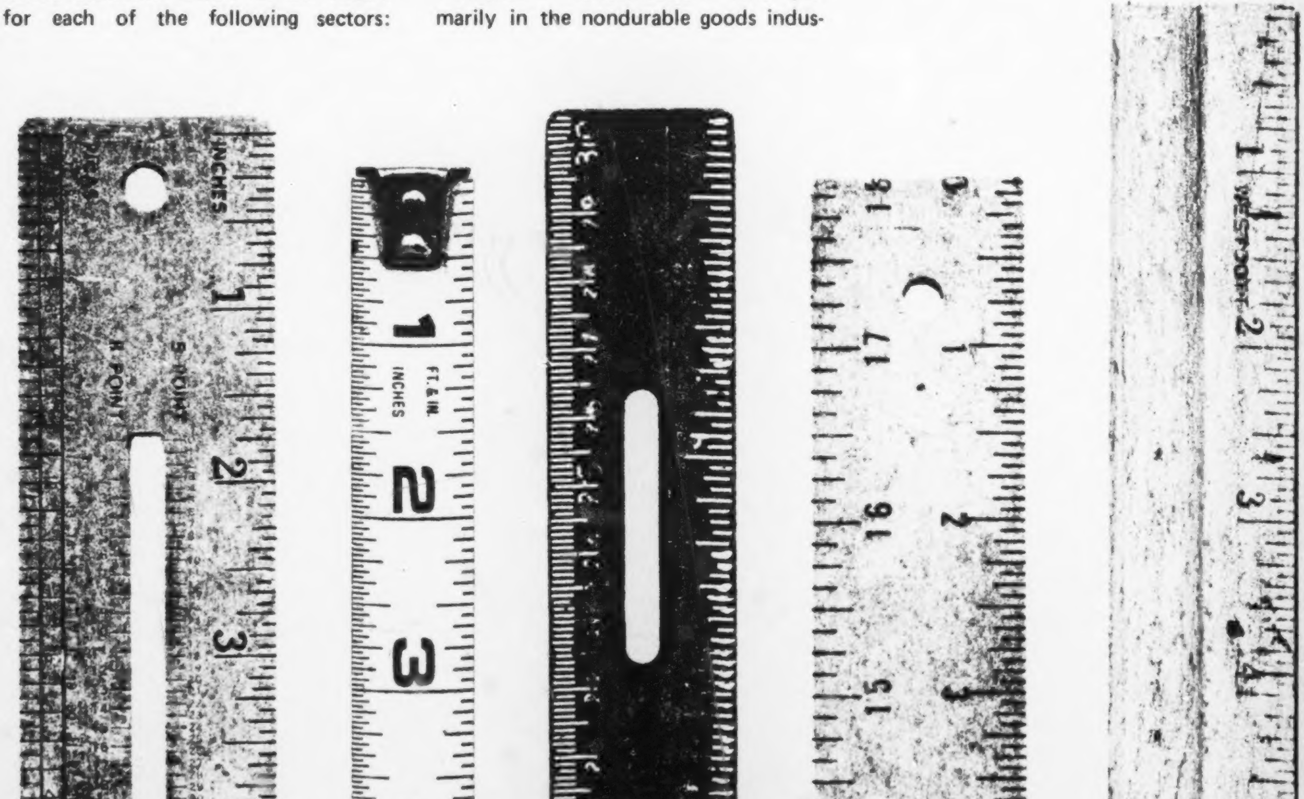
[1] The values reported for 1980 are preliminary and should not be viewed as final here or throughout the rest of the text.



decline at 15 percent. Nonelectrical machinery, electrical machinery, lumber, stone, clay and glass, and other durables also exhibited substantial declines.

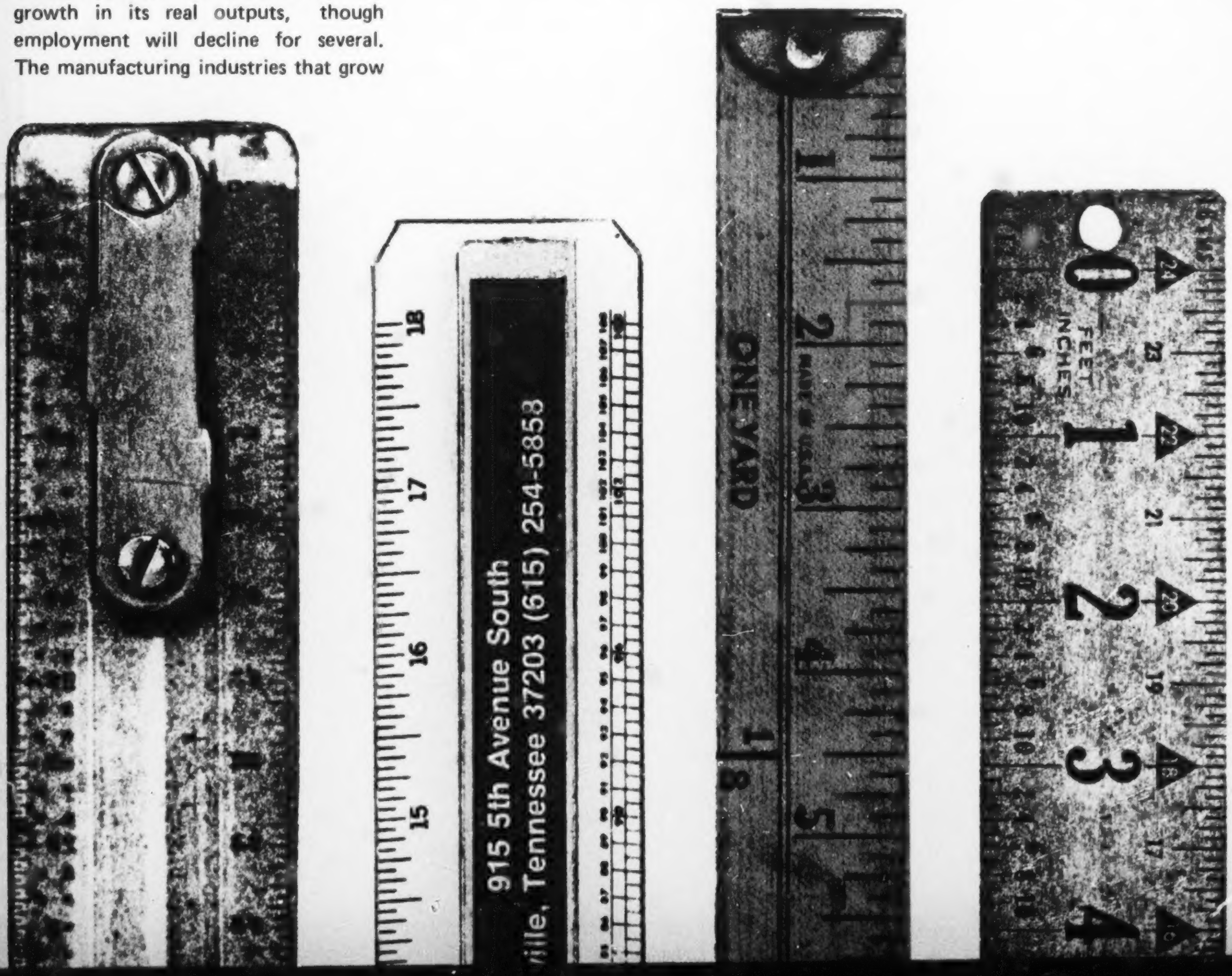
Of the state's nondurable goods industries, one-half had positive growth in real output in 1980, such that the aggregate demonstrated positive growth. Food, paper, chemicals, and other nondurables showed growth; textiles, apparel, printing, and rubber exhibited declines.

Real manufacturing output is projected to grow slowly in 1981 as the state's economy recovers from the national recession. Tennessee's manufacturing recovery from the 1980 recession is substantially less robust than the recovery from the 1970 and 1973-1975 recessions. Real output in the state's durables and nondurables industries is forecast to grow below 2 percent in 1981. Every manufacturing industry is projected to display positive growth in its real outputs, though employment will decline for several. The manufacturing industries that grow the quickest include lumber, primary metals, electrical machinery, chemicals, and paper. A more significant recovery for the state's industries is projected to occur in 1982.

Throughout the remainder of the decade (1982-1989), real output for both the state's durable and nondurable goods manufacturing industries are forecast to grow moderately, at approximately a 3 percent average annual rate. A slight national growth slowdown will occur in 1985 due to the effects of a short-term housing oversupply and the initial shock of the deregulation of natural gas prices. This will cause only a moderate output growth slowdown in the state's durable goods manufacturing industries during 1985. Industries slated to grow above average include lumber, furniture, primary metals, fabricated metals, electrical machinery, transportation equipment, printing, chemicals, and rubber.

Though growing faster than manufacturing nationally, Tennessee's manufacturing employment is growing slower than the average 1.5 percent annual growth for all Tennessee industries. By the end of the 1980's the employment share for manufacturing will dip from the current 29.1 percent to below 28 percent. This represents a continuation, but a slowing of the 1970's trend towards a lower state employment concentration in manufacturing, although the state will continue to be more concentrated in manufacturing than the nation. In 1989, the proportion of real manufacturing output in real gross product is projected to be 35.7 percent, slightly above the 1980 concentration.

Analysis of the more detailed manufacturing industries indicates that the growth will generally be concentrated in the durable goods sector such that Tennessee's manufacturing



sector is becoming more like the nation's. Average annual employment growth in durable goods industries will be 1.64 percent, compared with 0.73 percent in nondurables. Strong durable goods performers are expected to be transportation equipment, electrical machinery, primary metals, nonelectrical machinery, and fabricated metal products. One nondurable industry, rubber and plastics, is also forecast to grow strongly over the decade.

Preliminary figures indicate that 1980 real annual wage rates declined in each of the durable and nondurable goods industries as price levels rose faster than employee's nominal compensations.[2] Although real annual wages are projected to rise in most of the state's manufacturing industries in 1981, in general, 1981 real wages are not as high as they were in 1979. In short, employees' real purchasing power in 1981 will still be less than it was in 1979. Throughout the remainder of the decade real wages are expected to rise in every manufacturing industry, with the fastest rates of growth occurring during the 1982-1984 years. Excluding 1980, the durable goods industries that are projected to display above average real wage growth include furniture, stone, clay and glass, primary metals, and nonelectrical machinery. The nondurables industries that are projected to display real wage growth above the nondurables industries average are food and chemicals.

Finance, Insurance, and Real Estate

Tennessee's finance, insurance, and real estate industry (FIRE) was the fastest growing in 1980, exhibiting an overall insensitivity to the recession. As the remainder of the economic sectors rebound in 1981, the FIRE sector can be expected to continue its consistent (though slow) growth trend. From 1982 through 1989, real output in this industry is expected to grow somewhat slower than real gross state product. The growth rate of real output in the FIRE sector is also forecast to be somewhat slower than in the 1970's.

Employment growth will follow a similar trend, except that over the 1980's decade this sector is forecast to grow moderately faster than the growth of total state nonagricultural jobs. Employment in this sector should grow from 77.5 thousand jobs in 1980 to 87.7 thousand jobs in 1989.

Sector information in this article has been compiled by **William F. Fox**, Assistant Professor of Finance, and **Glen E. Schuler, Jr.**, Assistant Professor of Economics at the College of Business Administration, The University of Tennessee, Knoxville, from articles in **An Economic Report to the Governor of the State of Tennessee on the State's Economic Outlook, 1981**, published by the Tennessee State Planning Office, Nashville, Tennessee. The **Economic Report** articles were written as follows: Manufacturing, **William F. Fox**; Finance, Insurance, and Real Estate, **Richard M. Duvall** and **Albert L. Auxier**; Transportation, Communications, and Public Utilities, **Frank L. Hendrix**; Trade and Services, **Gary N. Dicer**; Mining and Contract Construction, **Glen E. Schuler, Jr.**; State and Local Government, **Kenneth E. Quindry**; Energy, **John R. Moore**; Agriculture, **Irving Dubov**; and Population, **Alan M. Schlottmann**.

Richard Duvall, Chairman of the UT Department of Finance, concludes, "The major reason for the faster growth in output in the FIRE sector in 1981 and 1982 is the faster growth in employment," with a productivity decline offsetting this employment growth somewhat in 1981 and reinforcing the growth in 1982.

Real wages in the state's FIRE industry are forecast to decline in both 1980 and 1981, with these declines being somewhat greater than the average decline in all of the state's sectors. Through 1984, real wages are forecast to grow somewhat slower than the average real wage growth, but after that time this sector's wage rate is forecast to grow moderately faster. Nevertheless, real FIRE wages are forecast to grow slowly throughout the 1980's, with only the state's trade, services, and state and local government sectors growing more slowly.

The savings and loan and commercial banking portion of the state's FIRE sector is specifically analyzed in the Tennessee Econometric Model (TEM). Recent changes in the nation's banking laws have blurred the distinction between commercial banks and savings and loan banks. These changes include allowing savings and loans to have NOW (checking) accounts and allowing commercial banks to pay interest on checking accounts. An obvious question posed by these changes is, "What effect will the recent banking law changes have on the balance between commercial banks and savings and loan banks?"

The current forecast from TEM indicates that savings and loan banks will perhaps reap the greatest short-run benefits of the banking law changes as their assets (loans plus securities) and deposits increase as a proportion of total commercial plus savings and loan bank assets and liabilities. Nonetheless, Professor Duvall concludes, "The expectation is that the size of the NOW accounts garnered by the S & L's will be relatively small, while the commercial banks will attract the larger NOW accounts." Further, because interest rates on commercial bank loans are high relative to other interest rates, commercial bank loans are forecast to grow as a proportion of total assets. On the other hand, since most savings and loan assets are composed of loans, the high interest rates on loans relative to securities will induce little additional growth in the proportion of their loan securities during the 1980's. Although commercial banks will be allowed to pay interest on their checking account balances, commercial bank time deposit balances, nevertheless, are forecast to grow at a faster rate than their demand (checking) deposit balances, in reflection of expected savings rate increases and continued interest rate differentials between time and demand deposits.

A second major question of the banking community concerns the influence of the Federal Reserve's (FED) new policy of controlling the money supply rather than interest rates. The FED plans to slow the rate of growth of the money supply to purge inflation from the economy, no matter what level interest rates may approach. The current high prime interest rate is a reflection of this policy.

The current forecast indicates that the growth rate of the banking industry as a whole will be slower during the next decade relative to the previous decade. Some of this slowdown is due to the slower rate of growth of the real money supply in the latter period. In addition, much of the remainder of the forecasted slowdown in the rate of growth in the banking sector is due to the projected slowing of the overall state economic activity during the 1980's.

Two final points about the current forecast for the state's banking sector can be made. First, the banking sectors' assets and liabilities contracted in real terms during 1980, with a recovery starting in 1981 and accelerating in 1982. Finally, average bank yields are forecast to peak at about 13 percent in 1980, and then decline gradually to about 9 percent in 1989 as the rate of inflation decelerates in both the nation and in the state.

Transportation, Communications, and Public Utilities

During the previous decade, the growth rate of real output in the state's transportation, communications, and public utilities sector (TCPU) was the quickest of any of the state's aggregate sectors. This trend is forecast to continue during the upcoming decade, but the average annual growth rate of real output is expected to be less than during the previous decade. Almost no growth in TCPU output occurred during 1980, but this industry is expected to grow at about the same rate as the state in 1981. From 1982 through 1989 this industry's real output is forecast to grow approximately 1 percent faster than gross state product in each year.

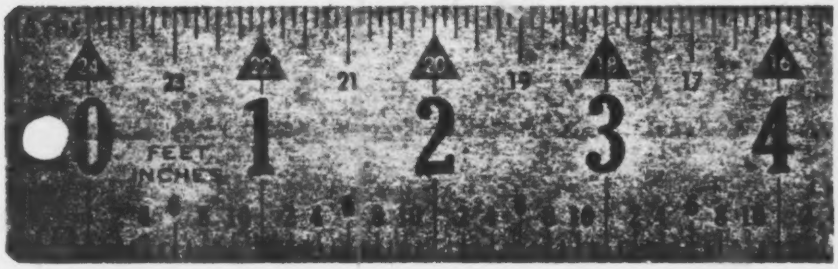
The federal deregulation occurring in many of the subindustries (for example, trucking, airlines, and railroads) is not expected to materially reduce this sector's growth. In fact, U.T. Professor Frank Hendrix writes, "More efficient motor carrier routing will reduce fuel consumption and reduce driver time and mileage. In addition, new tractor units being introduced in the motor carrier industry are 20 percent more efficient than the older units. Deregulation in the rail industry should enhance the opportunities to reduce employment and to accelerate the introduction of new types of service which used to be delayed for relatively long periods of time waiting for regulatory agency approval. These factors will tend to reduce costs and employment and increase productivity."

Although the state's TCPU sector is forecast to display the quickest output growth of any industry over the next decade, its employment growth rate is forecast to be somewhat below the average for the state's nonagricultural jobs. This slow rate of TCPU employment growth and high rate of growth results from the high productivity of its workers (output divided by employment) as they are combined with large amounts of capital to produce output.

Although real wages in the state's TCPU sector are forecast to decline in 1980, they bounce back strongly in 1981 so that real wages increase over the 1979-1981 years. Throughout the upcoming decade, the TCPU sector is forecast to display the fastest real wage growth of any industry in the state of Tennessee. Three reasons account for the real wage growth projection. First, worker productivity is forecast to grow the fastest throughout the decade. Second, this industry is more highly unionized than other industries in the state. Finally, since its workers require more highly developed skills, they will remain in short supply relative to the industry demand for employment.

Trade

Nationally, trade output (in real terms) fell by about 2 percent in 1980 as retail sales grew slowly and as real disposable incomes fell because of the recession, as the price of wholesale and retail goods rose relative to other prices (for example, services), and as the cost of buying on time (the interest rate) rose. Although each of these economic influences is affecting the state's economy as well, real trade output in the state declined by approximately four-tenths of 1 percent during 1980. Real trade output is forecast to rebound strongly in 1981,



primarily as a result of increases in real state disposable income during the year. Only the state's construction sector displays a quicker recovery from the current recession than the trade sector in 1981. Throughout the 1980's the trade sector's output is forecast to grow at about the same rate as real gross state output, with only TCPU and services growing more quickly.

Although real trade output declined slightly in 1980, trade employment grew by over 1 percent during the year. The forecasted recovery in the state's trade sector in 1981 is projected to result in an increase of almost 10,000 jobs in this sector during the year. Throughout the upcoming decade, it is expected that the number of jobs in the trade sector will grow at about the same rate as do total state nonagricultural jobs.

In a discussion of the 1981 trade and services sector, Professor Gary Dicer argues, "The main impact on this sector will be the size and timing of any federal tax reduction. It is highly probable that some reduction in personal federal income taxes will occur early in 1981 and should lead to a stimulation of consumer spending. How much stimulation, however, is debatable."

First, Dicer says that much of current spending is being supplemented by reduced rates of savings on the part of consumers and that declines in real personal income, accompanied by substantial differentials between interest rates on savings versus credit, have led many consumers to negative savings behavior. Thus, a tax reduction may go to replace savings rather than to consumption. In a similar vein, the tax reduction may go to reduce the high level of outstanding consumer credit instead of for new purchases.

Secondly, it is not clear how much of the federal tax reduction will be offset by increased taxes at other government levels. Much will depend on the tax actions of the 1981 Tennessee State Legislature. In addition, most local government bodies within the state are desperately in need of increased revenues. It would be difficult not to see some increases in local taxes which would offset the federal reductions. Finally, it must be remembered that there is also a substantial increase in federal Social Security taxes scheduled for 1981. This will hit almost totally the discretionary income of middle and upper wage earners.

Real wages in the state's trade sector declined by about 3.5 percent in 1980. This decline is a little larger than the average decline for all the state sectors. In addition, little rebound is expected to occur in trade wages in 1981. Throughout the remainder of the decade, real trade wages are expected to display the slowest growth among the state's sectors. Nevertheless, if 1980 is excluded from the calculations, the average annual growth rate of real trade wages is comparable to its growth rate in the 1970's. The large supply of and the low skill level required of trade employees are the primary reasons for the slow growth rates in average wages.

As in the nation, real retail sales declined in Tennessee during 1980, with most of the decline being due to the fall in real automotive retail sales. In 1980, real automotive retail sales declined by 13.5 percent relative to their 1979 level as consumers forestalled durable goods purchases in light of the recession, real state disposable income fell, and car financing rates increased. Because car financing rates are expected to remain high during 1981, a further decline of almost 3 percent is forecast for the state's real automotive retail sales. Real nonautomotive sales are expected to display slight growth during 1981. Since these sales are less frequently purchased with credit, they are more influenced by the 1981 growth of state disposable income than the continued high financing rates and charges. Overall, real state retail sales are forecast to display slight but positive growth during 1981.

From 1982 through the end of the decade, real retail sales are expected to grow moderately (at about a 3 percent average annual rate), with real nonautomotive sales growing more rapidly than real automotive sales. During the previous decade, real automotive retail sales grew somewhat faster than real nonautomotive retail sales. In short, it appears that the higher prices of gasoline and automobiles relative to the prices of other retail goods will cause consumers to shift their consumption away from automotive to nonautomotive purchases.

Services

Throughout the decade of the 1970's, only the state's TCPU sector grew more rapidly than the service sector. This relationship is forecast to continue throughout the 1980's as the national trend toward a more service-oriented economy continues and is reflected in the state's economy.

Real service output grew significantly during 1980, second only to the FIRE sector's real growth. No real 1981 increase in the growth rate of real output is expected, as there was no significant recession in this sector. In 1982, service growth will quicken again as this state's economy becomes more robust. From 1985 until the end of the decade, the state's service sector will grow about one-half percent more rapidly than gross state product.

Most of the output growth results from high employment growth because the level and growth of productivity has been weak. In both 1980 and 1981, the state's service industry should display the fastest employment growth rate of any state sector (8 percent in 1980 and 5.77 percent in 1981).

Dr. Dicer summarizes the employment picture in services with, "Employment in the services sector has been especially surprising, in light of the 1980 downturn in the overall state economy. The service sector seems to be insulated, somewhat, from general economic fluctuations. Part of this is a function of health care services which continue to increase, and also the ongoing shift of life styles from a product- to a service-oriented society." As was the case in the 1970's, this sector is forecast to have the fastest rate of employment growth throughout the 1980's--more than twice as rapid as total state nonagricultural jobs.

The 1980 decline in the real services wage rate is the largest of any state industry. Real service wages are projected to continue downward in 1981 and to display essentially no change in 1982. From 1983 through the end of the decade, the real wage in this sector is forecast to grow only moderately.

Mining

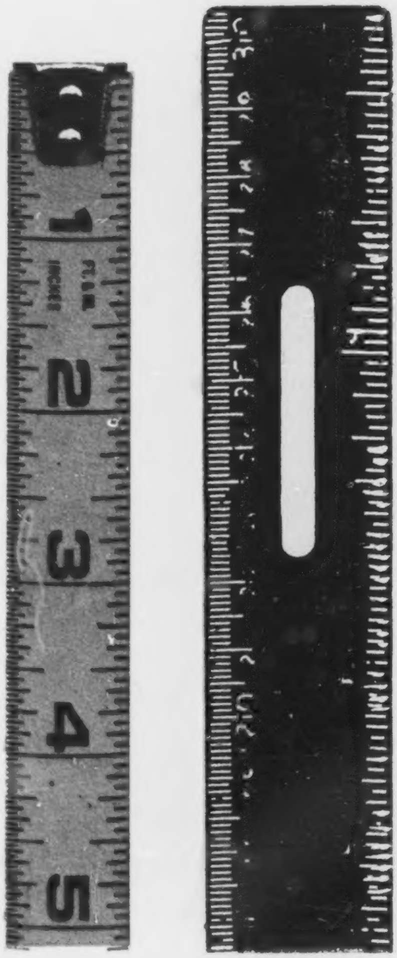
Real mining output continued to fall from a 1978 peak of $145.9 million to $107.9 million in 1980. Although higher energy and mineral prices have led to additional exploration and exploitation of the state's natural resources during the middle 1970's, this boom has slackened. From 1981 through 1989, real growth in mining output is forecast to be slightly positive in each year. Nevertheless, in 1989 real output in this sector will remain below its 1979 level.

Employment in this industry also fell in 1980. Of the state's nonmanufacturing industries, only contract construction's employment fell by a larger percentage. Throughout the remainder of the decade, mining employment is forecast to grow slowly, except for 1985 and 1988, when it is projected to decline slightly.

Although real mining wages are forecast to decline in 1980, they are projected to return to their 1979 level by 1981. Few relative changes occur in this sector's wage until 1985, when wages will begin to grow more quickly.

Contract Construction

One of the industries hit hardest by the 1980 recession was the nation's contract construction industry. As mortgage interest rates skyrocketed, plummeted, then skyrocketed once again, both real residential and nonresidential construction declined. The state of Tennessee's contract construction industry was no exception to this pattern. Its real 1980 output fell 13.7 percent from its 1979 level. Only the state's furniture and fixtures industry displayed a larger percentage of real output decline. Preliminary 1980 data suggest that total real gross state product fell by $166.5 million and real contract construction output fell by nearly as much, at $144.7 million. Had there been no offsetting output growth in some other nonmanufacturing and nondurables sectors, the declines in real output of the state's contract construction and durables manufacturing industries would have produced a more extreme recession than actually occurred.



A substantial recovery is expected in the state's contract construction industry during both 1981 and 1982 as mortgage rates decline moderately and pent-up demand is somewhat satisfied. Nevertheless, real construction output will not match its 1979 level until 1984. The growth rate of contract construction real output is above 3 percent from 1981-1989, second only to the TCPU sector. This rate of growth is comparable to its average during the 1970's.

Contract construction employment declined by 7.5 percent in 1980, third worst among the state's industries, and will decline slightly in 1981. Nonetheless, adequate capacity remains within existing construction firms such that additional construction will be undertaken in 1981 despite the smaller number of employees. From 1982 through the end of the decade, this sector's work force will grow moderately--in most years at or above the growth rate for total state nonagricultural jobs.

Although contract construction employment is forecast to decline considerably in 1980, its real wage will decline only marginally. During most years throughout the remainder of the decade its real wage growth will be above the real wage growth projected for the average of all sectors.

Government

In the **Economic Report to the Governor**, Kenneth Quindry summed up the state and local government sector by saying, "By all reasonable measures, Tennessee is a low tax state when compared with the average state in the nation. This is not likely to change in the foreseeable future, first because Tennessee's tax system is far less responsive to economic growth than the average state, and second, because the legislature is unlikely to increase taxes significantly."

State and local tax growth in 1981 and 1982 will be modest because of the low to moderate economic growth. In real per capita terms, a decline may be expected. The real effect, however, will be uneven because some public services depend more heavily on earmarked or slow growing tax sources (i.e., highways).

Because of the low tax responsiveness and the no-tax-increase stance of public officials, the public sector's contribution (e.g., the state government sector) to the state's economic output is likely to decline mildly in both the short (1980 to 1982) and the long (1980-1989) term. This would be a reversal of a mild upward trend in the 1970's decade.

The percentage of nonagricultural workers employed by state and local governments changed little in the 1970's decade and is not projected to change much in the 1980's decade. However, annual average wages for public workers are expected to decline relative to all nonagricultural workers. An actual decline in real wages is forecast for 1981, with only a minimal (0.29 percent) increase in 1982.

State and local government employment is forecast to decline slightly in 1980 and display essentially no change in 1981. Most of this trend can be explained by attempts on the part of government administrators to conserve funds due to the shortfall of state revenues by either not filling job vacancies or not hiring additional workers in these years. Throughout the remainder of the decade, state and local government employment is forecast to grow slowly, falling considerably below the growth rate of nonagricultural jobs in all years.

According to Quindry, the fiscal constraints in the 1980's will have some effect on state and local government employment and compensation rates. Both are expected to decline relative to the state totals in the 1980's. While employment increased relatively in the 1970's, it is expected to decrease in the 1980's. State-local employment is expected to increase by 6.1 percent in the 1980's, compared with a growth of 34.5 percent in the 1970's.

Energy

During the 1970's, several energy price and supply disruptions, such as the Arab oil embargo of 1973 and the Iranian oil shortfall and OPEC price increase of 1979, had severe economic consequences for both the state and the nation. During the 1980's, additional OPEC energy price and/or supply shocks may occur, with the attendant economic disruptions.

Dean John Moore of the U.T. Business College stresses this point by saying, "At the beginning of the decade of the 1980's, the secondary and tertiary impacts of the energy crisis are still reverberating throughout the other sectors of the economy (automobiles, steel, airlines, building materials) and affecting overall stability (inflation, unemployment). Unfortunately, we anticipate that some of the same shocks experienced in the 1970's are likely to continue in the decade ahead."

Many energy policy changes will be occurring in the next decade which have consequences for the state's energy and economic development. TVA has stated a desire to have excess electrical capacity in the early 1990's facilitated through an extensive nuclear plant construction program during the 1980's. This will cause TVA to raise its electricity rates in order to pay for the in-process nuclear plant construction. In 1980 alone, the stated TVA electricity rate increase has been about 24 percent, though only 15.3 percent was effective this year. Since this rate increase exceeds the national average, it causes Tennessee's industries that use electricity extensively to have above average increases in costs. In addition, since the Three-Mile Island accident, the nuclear regulatory authorities and the public have questioned the safety of nuclear power generation, and this has and may continue to cause delays in the development of nuclear power.

Another major energy policy change that will occur during the 1980's is the complete deregulation of oil and natural gas. The federal deregulation of oil will allow the price of crude oil produced in the U.S. to rise to the world market level. Moreover, the additional costs of crude oil will be passed on through its refined products such as gasoline and fuel oil. Most of the federal deregulation of natural gas at the wellhead, on the other hand, is expected to occur over the 1985 through 1987 years. Since the price of natural gas has been held below its equilibrium level by the federal regulations, the effect of this policy change will cause the costs to consumers to rise rapidly, as the wellhead price of natural gas increases during these years.

The impact of the 1970's changes were summarized by Dean Moore as follows, "During earlier decades of either constant or declining "real" energy costs, the growth in production was, in rough measure, tied to the growth in energy consumption. This close connection was 'uncoupled' in the 1970's. During that decade, real GSP increased by nearly 48 percent, while net energy consumed in the state grew by only 28.5 percent. As a result, the energy utilized per dollar of GSP was only 87 percent as great at the end of the decade as in 1970. Thus we see that not only can one fuel be substituted for another (electricity, fuel

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Glen E. Schuler, Jr., formerly with the Center for Business and Economic Research and now working for Tenneco Corporation, Houston, Texas, has interests which include energy economics and policy, econometrics and macroeconometric modeling.

oil, or coal for natural gas), but other inputs can be substituted for energy." Similar consumption and conservation patterns can be expected in the 1980's.

As noted above, the average price of electricity rose by 15.3 percent in the state during 1980. By sector, this implies increases of 14.9 percent for the state's residential customers; 15.2 percent to the state's commercial customers; and 15.7 percent to the state's industrial customers. The total demand for electricity by these groups is forecast to grow by only 1 percent in 1980, with the residential demands growing somewhat more quickly, the industrial demands growing somewhat more slowly, and the commercial demands growing at the same rate. In both 1982 and 1983, the average price of electricity is expected to rise nearly 11.75 percent. Because of the slowing rate of growth of electricity prices, the total demands for electricity are forecast to grow approximately 1.75 percent in each year. Throughout the remainder of the decade electrical prices are forecast to grow approximately 10 percent per year, and the demand for electricity is expected to grow around 2 percent per year. The industrial demand for electricity is forecast to grow the quickest during the 1980's, followed in order by the commercial and residential sectors.

Prior to the deregulation in 1985, natural gas prices are forecast to grow an average of 8 percent per year in the commercial and residential sectors and about 10 percent per year in the industrial sector. From 1985 until the end of the decade, as natural gas deregulation occurs, the price of natural gas is forecast to rise much quicker--by an average 12 percent per year in the residential sector; by 15.5 percent per year in the commercial sector; and by over 21 percent per year in the industrial sector. From 1980 through 1984, the demand for natural gas by these sectors is forecast to display little change. The total decline in the demand for natural gas during the 1985-1987 years is forecast to be approximately 4.5 percent per year as consumers conserve on the use of natural gas and switch to other less expensive fuels. By 1989, the demand for natural gas is expected to be lower than its 1980 level in each of these Tennessee sectors.

Although the price of fuel oil increased by a factor of five during the 1970's, the consumption of fuel oil grew quickly as industry transferred from natural gas to fuel oil as a boiler fuel. This occurred as industry could not obtain natural gas in the quantities they desired. Through the 1980's the demand for fuel is projected to grow slowly, only about 13 percent as rapidly as during the 1970's. Some acceleration in the demand for fuel oil is forecast to occur during the 1985-1987 years as firms substitute fuel oil for natural gas because of the deregulation of natural gas.

As is well known, the price of gasoline increased dramatically during the 1970's--at an average annual rate of 16.7 percent. Large increases in the price of gasoline are forecast to occur during the 1980's as well. Its price is expected to increase most rapidly during the 1980-1983 years and average about 14 percent per year over the entire decade. The demand for gasoline is projected to fall an average of about 2 percent per year during the 1980's.

The price trends for the future are summarized by Dean Moore: "In no case will the increase be as substantial as during the 1970's, but the overall increases projected for residential and commercial consumers of electricity and for residential consumers of natural gas are expected to be only slightly lower than the increases experienced from 1970 to 1979. For coal, gasoline, fuel oil, industrial electricity, and industrial natural gas, price increases in the 1980's are forecast to be substantial but considerably more modest in percentage terms than in recent years."

Agriculture

The short-range picture (1981 and 1982) for the agriculture sector appears unfavorable, as the average annual increase in cash receipts from farm marketings for all crops is estimated at 11.7 percent. The five most important products remain soybeans, tobacco, cotton, corn, and greenhouse and nursery products. Cash receipts from meat animals are forecast to grow only 9.4 percent and only 9.2 percent for dairy products. After production costs are excluded, the real value of gross state product arising from agriculture is forecast to decline an average 2.4 percent annually. Employment will decline slightly over the two-year time period.

Professor Irving Dubov argues that the long term must be evaluated by looking at the growth in demand and supply. He concludes, "U.S. domestic demand for agricultural products for traditional uses is expected to grow about 0.4 to 0.5 percent a year during the 1980's. Added to this will be uses as raw materials for new fuels. The result would be an annual demand growth rate of 1.6 to 1.8 percent. Adding expected domestic and foreign growth rates, total demand for American agricultural commodities is expected to grow as much as 3.0 percent annually."

A 3 percent annual increase in domestic agricultural production is possible, but limiting conditions will have to be overcome in the process. Adequate economic incentives will be needed to motivate investments needed for the production. This will include prices sufficient to cover the higher farm costs expected in the economic climate of the 1980's. Investments will have to be made in the transportation, storage, and handling facilities required for channeling the increased output through the domestic and export marketing systems. Finally, agricultural research and education will need funding to develop production and management techniques that will increase productivity and hold down production and marketing cost increases."

For the longer term, real output is forecast to rise 1.4 percent annually in the agriculture sector. Cash receipts from farm marketings are forecast to grow most rapidly in crops, followed by meat animals, and then poultry and eggs. Employment is forecast to grow very slightly over the long term.

Population

Preliminary returns on population from the 1980 Census are now indicating how significant the growth in population in Tennessee has been. The 1980 population estimate is 4.6 million, approximately 4 percent higher than the newest of the Tennessee population estimates available before the Census. It is 3.5 percent higher than the absolute level of population reported in the outlook table in the previous chapter. The outlook, however, correctly has stepped up the rate of anticipated growth in population in the state through the 1980's to 1.2 percent from 1980 to 1989. Since this is significantly higher than the anticipated rate of U.S. population growth, the difference is largely explained through migration.

Alan Schlottmann, writing in the **Economic Report to the Governor of Tennessee**, has said: "As a potential destination for interstate migrants, the level of net migration into Tennessee has been **significantly** higher than for any other state in the East South Central region. Thus, not only has the pattern of Tennessee's population growth dramatically altered from its historical relationship relative to the nation, but, in addition, Tennessee has displayed over the seventies the most 'robust' population (growth) in its region as well."

With heavy amounts of migration, Tennessee will escape some of the "natural aging" of the population that is expected nationally. Schlottmann says: "The percentage of the Tennessee population forecasted as 'school age' does not dramatically decline over time. When combined with the relatively high growth rates in total population forecasted over the period, no drastic decline in the absolute number of school age individuals would be expected. Similarly, the age composition of the labor force for the prime ages of 15 to 44 does not radically alter over the forecast period." This will significantly affect stability in the labor force, levels of productivity, new family formation, and the kinds of sales marketing within the state. ■

State Data Center Offers Public Services

Patricia D. Postma

On February 1, 1980, Governor Lamar Alexander's office announced that the State Planning Office would be the lead agency for the Tennessee State Center. The operation of the State Data Center is a joint project of the State Planning Office and the Center for Business and Economic Research (CBER) at The University of Tennessee, Knoxville. TSPO will play the lead role in providing data and consulting services to State Data users, while CBER will provide technical assistance to TSPO and provide data-processing services. CBER will publish the quarterly **State Data Center Newsletter**. Both agencies and the Bureau of the Census will cooperate to provide user seminars throughout the state.

As part of its program to publicize the collection and use of Census data, the Bureau of the Census hopes to have each state establish a Data Center to maintain libraries of Census publications, to publicize the availability and uses of the data, and to provide training and consultation services for users of both printed materials and computer processing. The State Data Center, in turn, must designate Affiliate centers across the state which will make the printed materials available to the public and assist users in their area.

Although the 1980 Census of Population and Housing has been the impetus for the formation of the State Data Center, the data held by the State Data Center and its Affiliates include every 1977 Economic Census as well as a variety of data user guides.

The Tennessee Data Center system is to be provided, free of charge, all of the printed materials relating to Tennessee from the 1980 Census of Population and Housing, the 1977 Censuses of Manufactures, Retail Trade, Wholesale Trade, Selected Service Industries, Construction Industries, and Mineral Industries. In addition, their collection will include the 1974 and 1978 Census of Agriculture and Current Population Reports, which provide annual intercensal estimates of population.

In addition to the newly designated Affiliate Data Centers, there are numerous Federal Depository Libraries which regularly receive Census data and other publications. To date there are 11 designated Affiliate Data Centers and 23 Depository Libraries. For information on The Affiliate and libraries nearest you, contact either Ms. Shirley Hart at the Tennessee State Planning Office (741-1676) or Ms. Patricia Postma at the Center for Business and Economic Research, U.T., Knoxville (974-5441).

Long-Run Goals

The Tennessee State Data Center hopes, as a long-range goal, to better identify the types and sources of data available for Tennessee, provide assistance in the use of all state data to users, and facilitate inter-agency exchange of data. To this end, an advisory committee to the State Data Center has been named, consisting of individuals from various agencies and organizations who are directly involved in either the generation or use of large amounts of data.

The achievement of the State Data Center's goal depends upon not only the exchange of information among those already heavily involved in data, but also upon disseminating information to new users among the public. Rationalizing data access and data use in the state must be a two-way process. The State Data Center hopes to hear from these new data users about their own data needs, since cooperation is the key to the success of this very important project. ■

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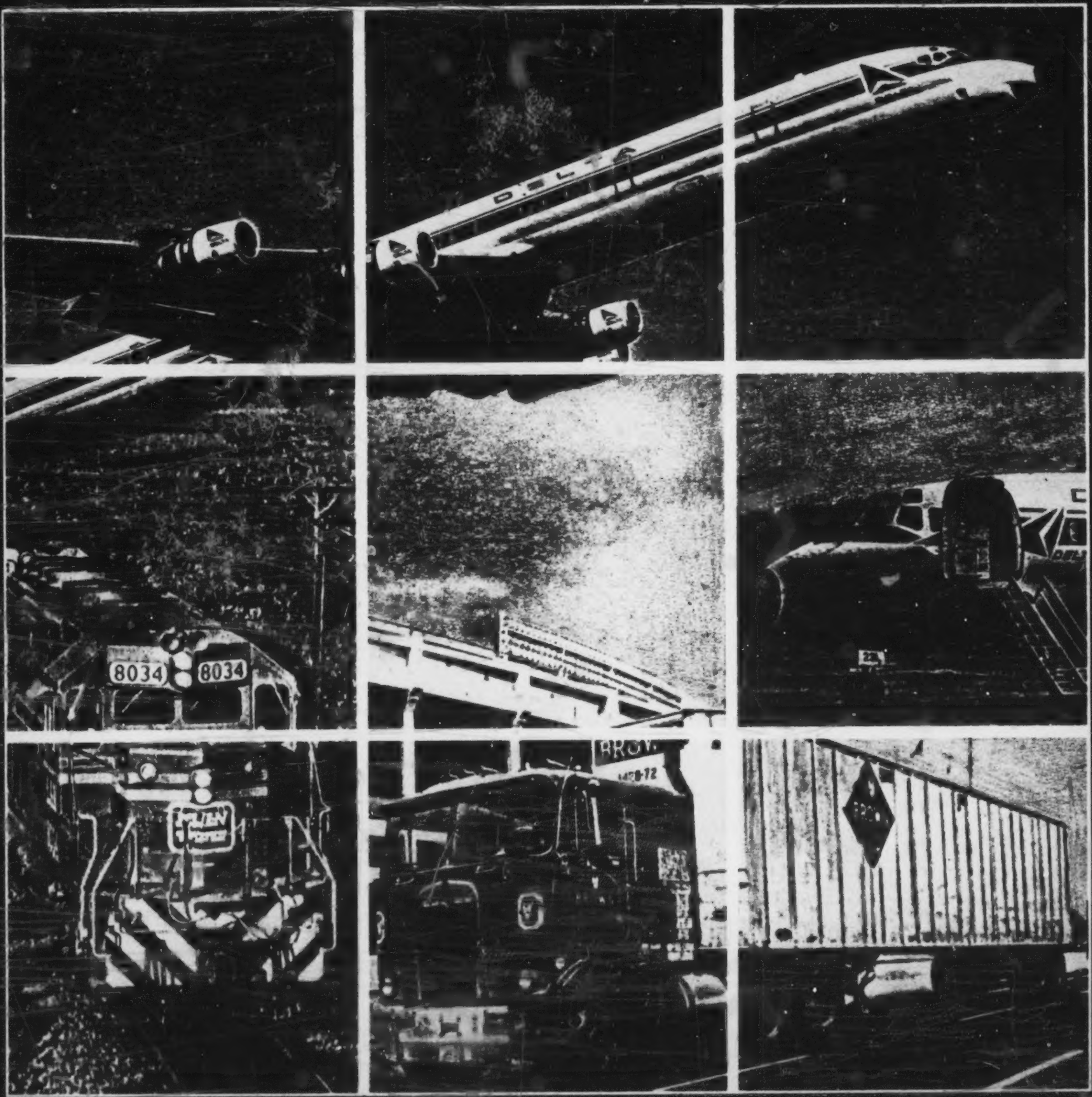
Deregulation



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The University of Tennessee

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Editor's Note:
The last two articles of the issue, though not addressing the Deregulation theme represented by the preceding articles, are offered on subjects of contemporary concern.

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Consulting Editors' COMMENTS

This issue of the Tennessee **Survey of Business** focuses on the justifications for and impacts of recent legislation which deregulates several transportation industries. Deregulation has received much attention in the political arena and in the popular press with regard to oil, natural gas, railroads, trucking, air travel, and other industries. Deregulation is hailed as a mechanism for cutting business costs and increasing competition in order to slow the inflation trend. Economists have long argued the merits of free enterprise for promoting economic efficiency. In keeping with these arguments, the deregulation of transportation industries is supported on the grounds that resources will be allocated more efficiently, and subsidies from some economic sectors and geographic regions to other less efficient sectors will be eliminated. The redistributionary effects of deregulation, however, can influence the location of economic activity, the choice of life styles available to residents, and the distribution of wealth in the United States.

The authors of the three deregulation articles are uniquely qualified to address many of the issues raised by deregulation. Mark G. Aron is Corporation Assistant General Counsel of CSX Corporation, the merged Chessie Seaboard Railroad System, Richmond, Virginia. He was previously Deputy General Counsel and Legislative Counsel to DOT and worked on regulatory reform proposals in both the Ford and Carter Administrations.

By virtue of his active involvement in finding technical solutions for rural transportation problems, Norman G. Paulhus, Jr., is an appropriate author for the chapter on problems experienced by rural communities because of deregulation. The final deregulation article is authored by Timothy L. Campbell. As an executive director for a small airport and an officer in several industry organizations, he is well aware of the impacts of deregulation on smaller airports and cities.

The Aron article provides an overview of the history of regulation, arguments for and against deregulation, and assessment of deregulation effects for the airline and trucking industries. The author notes that the arguments for deregulation, though taking many forms, could be reduced to the argument for the potential for lower rates. Arguments against deregulation include concerns about cutthroat competition, monopolistic tendencies, and harmful effects on small communities. Although the extent of deregulation varies by industry and the time since deregulation is short, the author concludes that the early effects are generally very favorable.

Norman G. Paulhus, Jr., specifically addresses the concern that rural places and small communities may be adversely affected by deregulation. He describes the potential problem of less populated places being low-density service areas that prove unprofitable for firms in the industry, although growth in many rural places may create a sufficient market that would make service viable. Paulhus concludes that many of the fears of loss of service in small places may have been overstated and that there are some unanticipated benefits from deregulation.

Timothy L. Campbell writes on the effects of airline deregulation on operations at small airports (defined as those serving 100,000 to 500,000 people). He says that airline deregulation has been painful for all participants in the air transportation system, but it is generally working to the advantage of large urban areas and to the disadvantage of small and medium-sized communities. This statement is defended with statistics on airline service and fares in Tennessee.

William F. Fox,
P. David Qualls,
Consulting Editors

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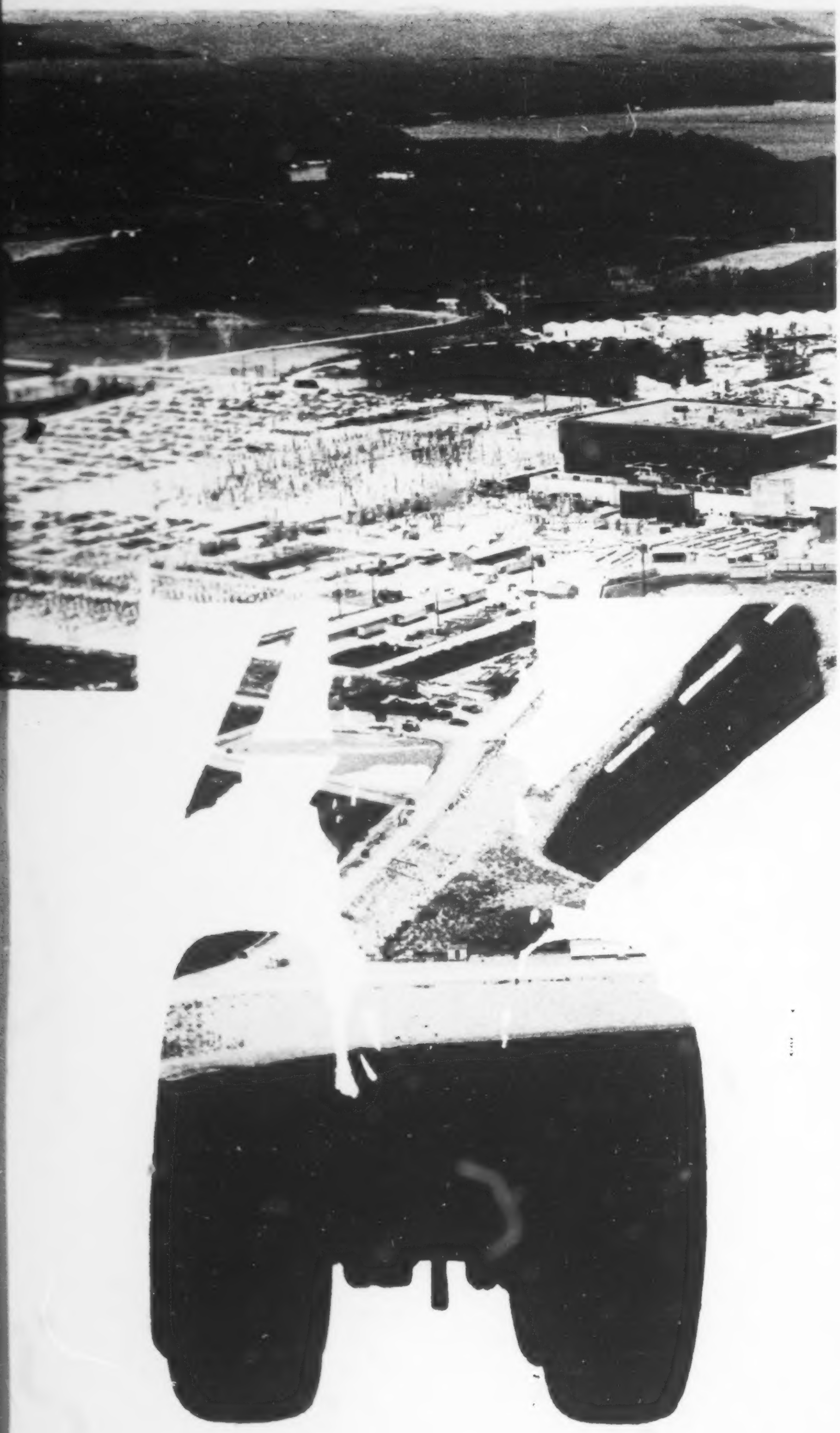

Deregulation: The Peaceful Revolution

Mark G. Aron

A virtual revolution in the basic laws that regulate the economic activity of our transportation industry has occurred in the last few years with the passing of legislation which has fundamentally changed the rules of the game for the airline, truck, and railroad industries. Once bastions of economic regulation, these industries are quickly becoming showpieces for a free-market approach to business.

This article briefly describes the economic rationale for the changes in the airline and trucking industries, the first two transportation modes to be deregulated. The various legislative proposals introduced, the arguments used in an attempt to stem this change, the legislation that emerged, and possible further changes that may be contemplated are also discussed, as are some analyses of the politics of these programs and an initial assessment of the results of the legislation.

Aviation Reform

The Railroad Revitalization and Regulatory Reform Act of 1976 was passed before the Aviation Deregulation Act of 1978, but it was the aviation proposal that excited the most attention and set the tone and pattern for the later truck and rail proposals. People were excited at the prospect of cheap transcontinental flights, but they did not understand either the railroad business or trucking, since those industries did not have the immediate impact that aviation had on the consumer. In addition, the Aviation Deregulation Act had gone further than other proposals in reducing government interference.

When the Aviation Deregulation Act was passed, it was highly controversial, but since 1978, its theories and directions have been accepted by the public and by many in the industry who once opposed it.

Although it was the Carter Administration that enacted the legislation for reform of the economic regulation of the aviation industry, most of the arguments for reform and the supporting materials were developed during the Ford Administration.[1] However, the arguments for reform can be found in the testimony of either administration.[2] It was first argued that regulation was not needed for the domestic aviation industry. The whole purpose for the original 1938 aviation legislation was to protect what was truly an infant industry, a virtual toy or plaything compared to the modern industry.[3]

The Civil Aeronautics Board (CAB) regulated both entry into the industry by new carriers and expansion by existing firms. In both these areas, the CAB had acted very restrictively to protect the interests of the carriers. It had allowed no new trunk airlines into the industry, and from 1969 to the beginning of the airline debate in the mid-1970's, it had imposed a virtual route moratorium. Most applications for new route authority were not even allowed a hearing, but were simply ignored. The legality of this procedure raised serious questions and this situation, plus the questionable "informal" meetings between members of the CAB and industry, provided some of the rationale for Senator Edward Kennedy's entry into the discussions.

The CAB also regulated airline fares, using a sophisticated fare formula. For complexity the formula was a marvel; its effect on competition was another matter. The formula used average industry costs and forced fares of the more efficient airlines to a level high enough to compensate the less efficient firms. The formula assumed an elasticity of demand of less-than-unity and, coupled with a CAB requirement that carriers obtain a 12 percent return, nearly foreclosed across-the-board fare discounts. The formula also demanded equal fares for equal distances, an egalitarian approach that ignored the varying costs of individual routes.

Even when the CAB awarded new routes to existing carriers, it often imposed extensive restrictions on them. For example, a carrier might be able to fly between points A and B, but only if it made an intermediate stop. Or a carrier might have authority to fly between Washington and New York City, but only if it continued on to Albany. Some carriers were forbidden to take on passengers at certain stops. When fuel was inexpensive, these restrictions were an annoyance. As fuel prices rose, they became catastrophic. The only rationale was that the restriction "protected" another carrier with an unencumbered certificate.

Capacity Agreements

Another example of anti-competitive regulations was the CAB's allowance of capacity agreements. With the CAB's approval, the carriers could agree to limit scheduling and capacity on certain routes. The CAB did allow significant restrictions to occur among the carriers between 1970 and 1975. The result was fewer and more crowded planes, but no reduction in fares. After deregulation was passed, some business passengers complained about crowded planes and linked this condition to deregulation, having forgotten that regulation can also cause the same condition.

Actually, except when the capacity agreements were in effect, excessive service competition in the form of free drinks and extra flights was one of the problems of the regulatory system. Unable to expand into new markets or to attract new customers with lower fares, airlines provided frills and engaged in excessive scheduling.

These conditions did not exist in intrastate air transportation, which the CAB did not regulate. In Texas and California (and later in Florida) large intrastate carriers developed. For significant periods, state regulation was much less extensive and restrictive than CAB regulation in entry and ratemaking. It was the experience of these intrastate carriers in a less regulated environment that proved the strongest argument for reform of the CAB.

During the Ford Administration, the Department of Transportation (DOT) commissioned a study of the intrastate experience.[4] The results of this study were quite unbelievable. Intrastate travelers in Texas and California were paying between 40 and 90 percent less for air travel than was paid for similar interstate transportation supplied by CAB regulated carriers. The intrastate carriers, with their discount fares and innovative fare structures, had been able to expand demand for air travel to a degree unheard of by CAB carriers. Load factors for the intrastates often averaged above 60 percent, in comparison to 50 percent for the CAB carriers, and the intrastates were as safe as the CAB carriers.

Arguments for Reform

The argument for deregulation then focused upon lower fares. The CAB's entry, pricing, and other restrictions reduced competition, resulting in waste and higher fares. Both Boeing and Lockheed produced extensive studies showing that an airline could make money on a transcontinental flight with fares of $100 or less if load factors were kept up. Some of the carriers, such as Texas International and United, began to offer fares with deeper discounts, and they were enthusiastically accepted by a more liberal CAB and by the traveling public. On the international scene, Laker Airlines introduced lower fares and the Skytrain.

Some carriers were attracted to reform, persuaded by their experience that regulation had not produced a particularly healthy industry. Excessive service competition had eaten up most of the monopoly profits. Several of the major carriers were in serious difficulty. As the debate intensified, United, Pan

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WHEN THE AVIATION DEREGULATION ACT WAS PASSED, IT WAS HIGHLY CONTROVERSIAL, BUT SINCE 1978, ITS THEORIES AND DIRECTIONS HAVE BEEN ACCEPTED BY THE PUBLIC AND BY MANY IN THE INDUSTRY WHO ONCE OPPOSED IT.

Am, Hughes Air West, Frontier, Flying Tiger, Federal Express, PSA, and the other intrastates, as well as some of the charters and commuters, lined up for reform. Texas International and a few others gave some private support, but still the bulk of the airlines were in opposition.

The Arguments Against Reform

The arguments made in the airline debate paralleled the arguments later made in trucking. Opponents argued that without regulation the industry would dissolve into chaos; there would be cutthroat competition and a tendency toward greater concentration and monopoly; airport and aircraft financing would be impossible; safety, ticket reservations, and baggage services were dependent on the regulatory system; and the existing system was not so bad.

The main thrust of the defense for deregulation was that there was a lack of empirical or theoretical data to support the negative expectations of its opponents. The positive experiences of Texas and California were a good indication of what could be done in other areas.

Foremost in the argument was the small community issue. The opposing airlines found that the various Congressional committees had a great many rural members and argued that smaller communities would be hurt by reform. They argued that there was a cross-subsidy from the routes between the larger communities to the routes to small communities. Rarely has a group of private companies engaged in such a philanthropic venture with so much zeal.

The problems with this argument were wonderfully documented in a series of Department of Transportation reports.[5] The CAB extensively regulated the airlines in terms of entry and rates, but, it turned out, not very much in terms of scheduling. For the cross-subsidy argument to be valid, the CAB had to be able to "force" carriers to serve small communities. This simply was not the case. Under the terms of the Federal Aviation Act, carriers had to provide reasonable service to points listed on their certificates, but the minimum service to fulfill this duty had been defined to mean no more than one or two flights a day. And these flights might arrive at 1:00 a.m., leave at 1:30 a.m., and might be scheduled to fly to some other small community rather than to a large city. The DOT conducted a study which showed that 1:00 a.m. flights connecting to East Podunk were the rule, not the exception.

Even worse, the CAB did not even enforce this minimum duty. Carriers regularly asked the CAB for permission to abandon points, and the requests were regularly granted. From the end of World War II to the mid-1970's, the trunks had abandoned almost 200 points to smaller airlines, and nearly 200 points lost certificated service entirely. Commuter airlines, for the most part unregulated by the CAB, were providing the bulk of service to the truly small communities. This abandonment process was not occurring through any ill feeling of the larger carriers toward the smaller communities, but as they replaced their piston fleets with jets, it simply became impractical to continue to serve the smaller communities. The commuters, with their smaller planes, were able to provide these communities with more frequent service.

The Proposals

Many aviation proposals were submitted. The Ford bill identified many of the areas and set the pattern. It provided a new statement of policy for the CAB stressing competition, required the removal of many of the route restrictions, and provided special provisions for the charter, commuter, and cargo industries to allow them greater expansion. In terms of entry, it used a dual approach. First, the bill had an automatic entry provision to allow any person to operate a certain number of routes each year without going through the long CAB processes. Second, it also allowed expedited entry to "dormant" routes, routes that existing carriers had but were not using. The pricing provisions created a relatively large zone of lawfulness and, finally, the bill provided a ten-year guarantee of essential service to all communities served by the CAB carriers on the date of enactment.

Technically, the Carter Administration did not have its own bill. Its policy was to obtain a "quick hit" and therefore to work with the existing bills. It supported the bill introduced by Senators Cannon and Kennedy (S.689) and parts of the bill later introduced by Congressman Anderson (H.R. 8813). One should stress the word "technically." The same DOT staff who

developed the Ford proposals provided drafting services to Senator Cannon's and Congressman Anderson's staffs, and there was a great deal of interaction, to say the least. As the hearings developed, the DOT staff was often asked to compare the various proposals and develop an Administration alternative. Often, all the provisions had the same origin.

The Cannon–Kennedy bill also contained a new policy statement, as well as provisions for restriction removal, automatic entry, dormant authority, and pricing freedom. But it also reversed the burden of proof in all entry proceedings – a provision and approach later brought into the truck bill. This bill also had a service guarantee, and eventually included a labor protection provision providing wage protection in case of major layoffs and an extension of the soon-to-expire federal loan guarantee program for aircraft purchase. The Anderson bill included almost all these areas, with slight differences in approach as to timing and the number of automatic routes. As indicated, the Administration basically supported these two bills, although it adopted a somewhat "neutral" policy regarding the labor protection and loan guarantee provisions. Congressman Levitas introduced his own bill (H. R. 9297). Its specific provisions did not go as far the Cannon–Kennedy or Anderson bills in the entry and pricing areas, but what it did propose was to sunset the CAB entirely by 1985. At first, it was thought this was a tactic to divert attention from the more specific provisions, but as time progressed sunset became more real. After extremely long hearings in the Senate and House and a great deal of tension between DOT Secretary Brock Adams--not an ardent supporter of reform--and the White House Staff, legislation emerged that was more radical than had been expected. The bill contained most of the policy changes, automatic entry, dormant authority, labor protection, subsidy, and restriction removal provisions from the various proposals, but the crowning glory of the package was the sunset provision, which provided for the phased termination of the CAB by 1985. Other bills would contain extensive reform, but this would be the only bill to so finally end a regulatory system.

Assessment of Reform

About three years have passed since enactment of the Deregulation Act, but it still may be too soon to evaluate its effects. Carriers are still adjusting to a new way of life. General economic conditions have negatively affected the discretionary traveler. The increase in fuel prices has created some havoc with the airlines. But overall, the results have been favorable.

According to CAB and DOT assessments, the results of deregulation through the end of 1979 were quite spectacular.[6] From the beginning of 1978 through the end of 1979, airline fares, when adjusted for the increase in the overall consumer price index, actually declined by about 3.5 percent. Industry costs rose 56 percent from 1976 (the beginning of the more liberal CAB rule) through 1979. During this same time, airfares increased only 21 percent. Overall, service increased in terms of total departures, and load factors rose sharply.

AFTER DEREGULATION WAS PASSED, SOME BUSINESS PASSENGERS COMPLAINED ABOUT CROWDED PLANES AND LINKED THIS CONDITION TO DEREGULATION, HAVING FORGOTTEN THAT REGULATION CAN ALSO CAUSE THE SAME CONDITION.

Starting in 1979, the picture began to change somewhat as 1980 fuel prices increased 55 percent over 1979 levels. The country continued to experience a significant economic downturn. The industry felt these pressures: 1979 profits declined from their record 1978 levels and began to cross over to the loss column for the industry as a whole in 1980, traffic levels fell as some airlines tried to recoup lost profits and increased costs with higher fares, and load factors began to come down.

But even in the hard times since 1979, the "experiment" still seems like a success story. Although fares rose significantly in 1980--26 percent on the average--this increase was still below the increase in costs, and the airline customer continued to receive a relative bargain. DOT figures show that through the third quarter of 1980 airline fares increased on average just under 35 percent when compared to the third quarter of 1977, while operating costs for this same period increased by almost 44 percent.

The profits for the trunk airlines were down, with a few exceptions, but profits for most of the regional airlines, including many of the old intrastate carriers, were very strong. Contrary to the earlier arguments, the smaller carriers seemed to be in a better position to take advantage of deregulation.

Although mergers tended to reduce the number of airlines, the expansion of the intrastate carriers, the introduction of new carriers such as Midway and New York Air, and the expansion into new markets by older carriers more than compensated for the reduction, in terms of new competition.

In terms of small community service, departures nationwide have increased 96 percent over the 1978 level. The increase occurred at all hub sizes. Of course, certain areas lost service (Alabama departures were down 28 percent), but others gained (Arizona was up over 38 percent). And only one community, at its own request, lost all air service.

Perhaps the greatest success is that the industry survived a turbulent period with only a few bruises. It is hard to contemplate how the rigid system of the early 1970's would have coped with such dramatic changes.

The Aviation Deregulation Act of 1978 may not be the end of the story. Just recently, the Reagan Administration introduced its proposal to finance the nation's airport system. Attached to this proposal was a provision to expedite sunset of the CAB by September of 1982, and a separate CAB sunset bill has just been introduced.

Trucking

From its inception in 1935 to at least the mid-1970's, regulation of interstate trucking changed very little. It was highly protective of the trucking industry, especially in the important areas of ratemaking and entry. Truckers were allowed a special exemption from the antitrust laws and were able collectively to set rates, an activity that was a felony for other industries. The Interstate Commerce Commission (ICC) significantly limited entry into the industry, and although the nation's economy had grown manyfold since the 1930's, the number of interstate trucking firms actually declined about 40 percent from 1935 to the mid-1970's. Carriers were also saddled with innumerable restrictions regarding their operations.

As inflation and fuel use became more of a problem, the regulatory scheme came under increasing attack. Against this background the Ford Administration, toward the end of its tenure, introduced its Motor Carrier Reform Act (H.R. 10909).[7] Actually, the proposal was somewhat mild compared to what would later be introduced. It was not a "deregulation" proposal if that term means the total removal of the regulatory scheme. Its pricing provision did not deny the ICC the ability to review rates except in a limited number of cases. Instead, it simply limited the ICC's ability to suspend rates pending the ultimate decision. Similarly, the entry provision of the bill retained many of the current obstacles to entry. But it created one significant safe harbor: applicants who were found to be safe and responsible and who proposed compensatory rates had to be allowed entry. The bill, however, was radical in proposing to eliminate collective ratemaking through the rate bureaus and to increase the use of "independent operators," people who own their own trucks and usually do not have operating authority from the ICC.

Even though this was a compromise proposal (and was criticized for its mildness by the Department of Justice), it was not met with enthusiasm by the industry. Its cool reception produced some second thoughts in the mind of DOT Secretary William Coleman, and only limited hearings were held before the close of the Ford Administration.

But in many ways the bill served its purpose. It was clear that the trucking industry and the Teamsters vigorously opposed it and that an educational process would have to be initiated. Many fine studies were completed during this time, a first-rate pamphlet was produced, and the Ford introduction of a trucking bill allowed later backers of the Carter proposal to claim legitimately that trucking reform was a bipartisan effort.[8]

The Carter Proposal

Introduction of a trucking proposal by the Carter Administration had to await the passage of the air deregulation proposal. It was feared that if a truck bill were introduced too early, opponents--especially the Teamsters--would be forced to oppose the air bill for fear that it would create a precedent and momentum for reform in the trucking industry. In addition, a decision was delayed until the usual disagreements between the DOT, the Department of Justice, and others could be ironed out. The DOT favored a more "political" bill that focused upon specific problems but stopped short of deregulation. Others in the Administration wanted to go all the way. Further complicating the process were the activities of Senator Kennedy and the uncertain attitude of Secretary Adams.

In the end, a small team from the DOT, working toward the end of the process with the Kennedy and White House staffs, developed a "non-deregulation" bill. The bill was highly political in the sense that it attacked areas that were thought to appeal to various segments of the public. There was a provision dealing with the problems of the farmer and food transportation, and one dealing with owner/operators, another vocal group pressing for reform. A key series of provisions was drafted to eliminate the ICC restrictions that prohibited carriers from going the most direct route, making wanted stops, and filling up their trucks.

The entry provision was far simpler than in the Ford bill. The Carter provision, on its surface, retained many of the existing ICC tests for entry but significantly changed them. The bill did not remove the requirement that new entrants prove that they were "fit, willing, and able," essentially safe, and financially responsible. But it did change the second part of the test relating to "public convenience and necessity," shifting the burden of proof in this test from the applicant to the opponent, and redefining "public convenience and necessity" to stress competitive factors.

As for ratemaking, a zone of pricing freedom was introduced, but contrary to the earlier proposal, this zone excluded all review by the ICC. Finally, the bill phased out collective ratemaking by the rate bureaus.

The compromise bill was still not greeted enthusiastically by the industry. But with plenty of time left in the administration, the active support of President Carter and Senator Kennedy, and the heavier involvement of Secretary Neil Goldschmidt, the issues were debated in a more thorough manner.

The Argument for Change

Many reasons were used to support passage of the bill, and most can be found in the testimony of administration officials.[9]

The system was said to be outdated. Trucking regulation was introduced in 1935 in the midst of a great Depression to protect against the particular problems of that era and to help nurture a somewhat fledgling industry. Truck regulation was also introduced at the behest of the rail-

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roads, who were fearful of competition from unregulated carriers.

Proponents argued that times had changed. The Depression was a matter of history, the infant was basically healthy, and the railroad industry was now seeking less regulation for itself and would accept less regulation of its competitors. In essence, the system was said to be turned on its head. Originally designed to protect the public, it was instead protecting the industry itself from competition. A prime example of this was the administration of traditional entry tests by the ICC. According to the Interstate of Commerce Act, as interpreted by the ICC, new entrants had to prove that their fitness and entry were required by the "public convenience and necessity." The second part of this test was further defined in the *Pan American* case to require a carrier to prove that his proposal was in the public interest, that other carriers could not perform the service, and that his entry into the market would not unduly harm the existing carriers.[10] In other words, the whole focus was upon the existing carriers, not the public. As indicated earlier, strict enforcement of this entry policy had actually reduced the number of carriers in the industry.

STUDIES CONDUCTED BY THE U.S. DEPARTMENT OF AGRICULTURE, AFTER SEVERAL . . . ITEMS WERE DEREGULATED IN THE LATE 1950'S, SHOWED THAT SERVICE IMPROVED AND RATES DROPPED ALMOST 20 TO 30 PERCENT AFTER DEREGULATION.

Early in the debate, opponents of reform provided figures showing that the ICC regularly approved thousands of applications each year and that it turned down few applications. But a large proportion of these applications were by *existing* carriers who asked for very narrow extensions of authority.

The test for new entrants, who were forced to buy existing authority, was particularly burdensome for minority groups. These groups were not well represented in the pre-1935 trucking environment, and their low level of participation in the industry was perpetuated by the ICC's restrictive entry policies. DOT figures indicated that, of approximately 15,000 regulated truckers, no more than 150 were minority-owned. Thus, the entry system limited competition and was *de facto* discriminatory.[11]

Another example of the "upside-down" nature of the regulatory system was the use of rate bureaus. The rate bureaus were private organizations of carriers whose main purpose was to set rates collectively. As indicated earlier, these bureaus operated under a special exemption from the antitrust laws. Although the carriers argued that the rate bureaus were necessary to provide stability and order and thus to help the consumer, it is quite clear that the effect of the rate bureau system was to inflate rates.

The system was also said to be illogical, indeed almost Byzantine in its complexity. One example, used over and over, was the farm exemption. Even in the 1930's, farmers had opposed regulation of trucking and had been able to carve out a large exemption for "unprocessed agricultural" items. The problem was that it was difficult at times to determine what was "processed." The ICC, as a good regulator, developed a pamphlet entitled "Can They Do That?" to explain the distinction--a pamphlet that became the joy of the reformers and the bane of the truckers.[12] According to the pamphlet:

- Raisins are exempt, if coated with honey, cinnamon, or sugar, but not if coated with chocolate;
- Frozen dinners are exempt, unless they are frozen chicken or seafood dinners;
- Crab shells are exempt, but oyster shells are not; and
- Manure in its natural state is exempt, but "manure, fermented, with additives such as yeast molds, producing a rich liquor which in water solution is used for soil enrichment" is not exempt.

The existing system was also said to be extremely wasteful, heavily burdened with red tape. It was reported that in one year several hundred thousand pages of tariff changes were filed at the ICC. The system also took too much time. Entry applications took months. Examples were found of minor rate questions that took over a year to decide.[13]

The system also caused enormous amounts of fuel to be wasted. Most certificates were tightly restricted in terms of the items that carriers could haul or the routes over which they could travel. As a result of these route and commodity restrictions, extra miles were traveled and trucks ran empty or only partially filled. One ICC study found that 16 percent of trucks operated by regulated carriers, and over 20 percent of trucks operated by exempt and private carriers who were significantly restricted in their ability to carry regulated freight, ran totally empty.

The bottom line of all this was that the existing system was inflating rates and costs. The President's Council of Economic Advisers estimated that the system of regulation was costing the public between $5 and $6 billion a year.

Studies conducted by the U.S. Department of Agriculture, after several agricultural items were deregulated in the late 1950's, showed that service improved and rates dropped almost 20 to 30 percent after deregulation.[14] A recent DOT study compared intrastate and similar interstate movements in New Jersey.[15] Intrastate New Jersey traffic is for the most part deregulated, and the rates for these movements were 10 to 15 percent lower than for comparable interstate movements. A study of household movers operating within the State of Maryland--where this class of truckers is also unregulated--showed that rates for intrastate movements were more than 40 percent lower than rates for regulated interstate movements.

DOT studies of partially exempt shipper associations found that the use of these associations reduced truck rates

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by 15 percent.[16] Senator Kennedy's staff compared rates for truck load (TL) and less than truck load (LTL) traffic. Because of the competition from private carriers, TL traffic is quite competitive, whereas LTL traffic is highly regulated and not generally competitive. These studies showed that the rates for TL traffic were increasing at a rate below the consumer price index in comparison to rates for LTL traffic, which were increasing at rates above the consumer price index.

Strong evidence that excessive rates were caused by overregulation came from other sources. Until the possibility of deregulation became more and more a reality, truck certificates were traded for sums far in excess of their "good will" value. The operating authority of one bankrupt carrier was traded for millions of dollars. This could only be accounted for by the ability to charge higher rates.

Similar proof was offered by the ICC regarding rates of return in the trucking industry. Profits were exceptionally good during the time the bill was first introduced, especially for the larger firms, and returns on equity of over 20 percent were common.[17]

The Arguments Against Reform

The opponents of reform, principally the American Truckers Association (ATA) and the Teamsters, waged a mighty battle. In fact, the ATA hired a major public relations firm and spent millions in its effort.[18]

The arguments against reform in many ways paralleled the arguments initially advanced by opponents of aviation reform. It was first said that the trucking industry was somehow special, different from other industries. But there was little in-depth analysis of this argument.

One variation of the theme was that the trucking industry was a "public utility." The problem with this line of reasoning was at least twofold. The regulated trucking industry, with more than 15,000 members, was far from a monopoly, and most responsible evidence indicated that, in the absence of regulation, it would not exhibit monopolistic tendencies. In addition, regulation of public utilities was supposed to protect the public, and it was difficult to argue that trucking regulation protected the public, and not the industry itself. Thus, the industry and its regulatory scheme did not seem to fit the public utility mold.

A further variation of this theme was that deregulation would result in "destructive competition" in terms of rate wars, instability, discrimination, predatory conduct, and increased concentration. But many witnesses testified that the trucking industry was not conducive to "destructive competition."[19] Fixed costs were a small proportion of total costs. Predatory conduct was not likely if there was liberalized entry. A predator might be able to remove one competitor with below-cost rates, but others would soon enter, denying the predator the ability to recoup his initial losses. Also, discrimination would be difficult in a situation where entry was relatively free in terms of start-up costs and regulatory barriers. In fact, studies showed that extensive discrimination was built into the then-current regulatory scheme. Articles with the same transportation costs often were subject to different rates, even after one accounted for differences in insurance costs. Closer-in communities paid more in certain cases than more distant communities.

Pros and Cons

The concentration and tendency-to-monopoly argument was offered many times by opponents of reform, but most economic studies did not show any tendency toward concentration. Most found that relatively small firms were quite efficient and able to compete with large firms, and that there were few economies of scale. Some argued that there were certain "network" economies that accrued to the larger LTL firms, which did, in fact, have a sizable investment in fixed facilities. But a more careful analysis of this argument revealed that these network advantages were products of the regulatory system that allowed larger firms to maintain their size and restrained smaller firms from growing. Remove the regulation, and the network advantage would dissipate.

The arguments against destructive competition were not based only upon theory and analysis of market structure. It was pointed out that only a relatively small part of the trucking industry was regulated. The rest--exempt carriers, private carriers, and intrastate carriers--were far less regulated. Yet, there was no evident chaos and destruction in these segments of the industry.

The second major argument was that existing interests--trucking certificate values and labor rates in particular--would be hurt if there were less regulation. It was argued that many had worked hard to increase the value of their certificates, and this value might be lost if there was reform. Similarly, increased competition would put pressure on wage rates. Furthermore, it might be harder to organize drivers. Under existing labor law, truly independent operators could not be organized since they were self-employed. With easier entry, more "workers" would obtain their own certificates and join the ranks of the self-employed. What the Teamsters feared was the increased use of a broker-type system where central brokers would deal with a whole series of smaller certificated carriers.

Early on, the argument about certificate values faded. Many in the financial community indicated that certificate values had already fallen dramatically in recent years because of the threat of reform. In addition, arguments about wages and certificate values were a two-edged sword. They initially were used to defend against reform, but the very existence of excess certificate values and wage rates argued that something was wrong with the system.

Again, in a pattern similar to the aviation debate, safety and small community service were held up as reasons not to reform the system. A report was produced by Professor Daryl Wycoff which seemed to indicate that less-regulated carriers were less safe.[20] Others argued that if competition were increased, there would be pressure to cut corners and safety would be the victim. Administration staff questioned the validity of the Wycoff study. Independent data from the DOT produced no evidence that less regulation meant less safety.[21] In fact, the ICC had little to do with safety. Truck safety was administered by the Bureau of Motor Carrier Safety (BMCS), part of the DOT. To put a final cap on the safety issue and to correct what was seen as a long-standing safety problem that existed independently of the deregulation issue, the DOT attached a second title to the truck reform bill aimed at somewhat increasing the size and strength of the BMCS program and initiating a new state program. This safety title was not wholeheartedly welcomed by deregulation purists, but many later considered it an astute move.

The final and most difficult issue was the question of small community service. Many members of the Senate Commerce Committee and the House Public Works Committee came from rural areas. The opponents of reform lobbied heavily to try to convince these members and the general public that deregulation might result in marginally improved service to larger cities, but that this improvement would be at the cost of service to smaller communities.

The theory was that service to small communities was unprofitable, while service to larger areas was profitable. The ICC forced carriers serving the larger areas to cross-subsidize the service to smaller communities. If the truck stopped in a small community, it stopped there only because of regulation.

There were many problems with this cross-subsidy theory, and it should be pointed out that never in this debate was it anything more than a theory. No credible study was produced to prove the existence of the cross-subsidy.

On the other hand, numerous studies showed the theory to be incorrect. An early DOT study in North Carolina, for example, showed small community service to be quite profitable if carriers tailored their services to the special needs of smaller communities.[22] A more extensive study, commissioned by the Senate Commerce Committee, showed that most carriers found their small community service to be "desirable."[23] A survey of recent entry applications by Administration staff also found hundreds of applications for service to smaller communities, hardly a situation that would prevail if the service were unprofitable.

Most of the evidence also found the ICC was not forcing much cross-subsidy or small community service. It had never removed a certificate for failure to serve a small community. The Chairman of the ICC also testified as to the lack of enforcement. In fact the small community obligation was ill-defined. Carriers could reduce the level of service at will and the ICC was found to have a liberal exit policy. No carriers proposed changing the exit policy of the ICC since it seemed to allow them to do almost anything they wished.

An extensive study of the inland Pacific Northwest conducted for DOT, based both upon actual surveys of shippers and also upon an analysis of data, indicated strongly that when it came to small community service, carriers were in many ways acting as if there were no regulation or service obligation. In countless communities, only a fraction of the carriers that were supposed to serve were found to do so. When economic conditions declined in various parts, service also declined.[24] This Pacific Northwest study confirmed earlier findings of a study of service in Wyoming done by the Rocky Mountain Governors Association.[25]

After receiving testimony on the results of the studies before the Senate Commerce Committee, certain members of the Committee asked DOT to do short studies of service in their own states. The initial studies were conducted in Nevada, New Mexico, and Kentucky. Later studies would be done in Michigan, Alabama, Nebraska, and Kansas. Rarely have "studies" had so much impact upon a debate. The studies were carried out by the DOT staff within a short time frame. In most cases, two towns in each state were independently selected and two DOT staff members were dispatched to spend a few days in each community collecting answers to a fairly simple questionnaire.[26]

The studies were far from scientific, and they would not have been so impressive had they not been keyed to critical members, and had they not been so consistent. Essentially what these studies found was that very little of the service provided to smaller communities was provided by regulated carriers. In many cases 80 to 90 percent of the service was provided by a combination of private, intrastate, and farm co-op carriers, with a substantial amount of UPS service. These studies confirmed earlier data from the U.S. Department of Agriculture. UPS, a regulated carrier of small packages, was not of the ordinary mold. It was not part of a rate bureau and did not oppose regulatory reform. In many cases, regulation was seen as inhibiting small community service by limiting UPS operations or by interfering with owner-operator servicing in rural areas. A good summary of these studies can be found in a recent submission of the DOT to the ICC in Ex Parte No. MC-77, prepared by Ed Rastatter and Karen Borlaug, two of the DOT staff who directed the small community studies.

THE ICC FORCED CARRIERS SERVING THE LARGER AREAS TO CROSS-SUBSIDIZE THE SERVICE TO SMALLER COMMUNITIES.

(AFTER THE MOTOR CARRIER ACT),. . . TRUCKERS ADMITTED THAT THEY WERE FILING UNPRECEDENTED APPLICATIONS FOR NATIONWIDE AUTHORITY AND ENTERING NEW AREAS.

Opposition Bills

The ATA (S. 1496) and the Teamsters (S. 1497) introduced their own legislative proposals. Although the ATA tried to characterize their proposal as reform-oriented, it was difficult to agree with them. On the key issue of entry, their proposal did not reverse the burden of proof and in fact attempted statutorily to ensure that the ICC would have to focus upon how new entry would affect existing applicants. There was virtually no provision dealing with restriction removal except for a short phrase exhorting the ICC to do good. The current agricultural exemption was not expanded. Only a narrow no-suspend zone was included, and there were several exceptions even to this zone. As for rate bureaus, the ATA dug its heels firmly into the ground. Their bill would have made it harder for the ICC to disapprove rate bureau agreements and would have extended the antitrust exemption to intrastate rates. The provisions dealing with private and contract carriers were significantly less generous than those proposed by the Administration. The Teamster proposal was similar to the ATA bill in most respects, except for a few safety provisions and a provision that generally exhorted the ICC to more vigorously enforce the common carrier obligation and therefore, perhaps, to provide more jobs.

The Final Outcome (S. 2245)

The hearings on the truck bill were extensive. Once a strong bill was reported out of the Senate, House members sought a compromise that would relieve them from the pressures of the Administration on one side and the ATA and Teamsters on the other.

There has been much debate as to who won the war. The opponents claimed that they had saved the nation from deregulation, but as can be seen by a review of the Ford and Carter proposals and the Airline Deregulation Act, the Administration bills did not call for full deregulation. As to who won, many, if not most, of the Carter proposals were incorporated into the final legislation. The entry provision of S. 2245 as enacted reversed the burden of proof and redefined public convenience and necessity to stress competition. The ICC was mandated to remove most of the restrictions that had been discussed in the debate. Private carriers and contract carriers received expanded authority. Some expansion was made in the agricultural exemption, and a special provision was included for owner-operators. These last two provisions were not as liberal as the Administration had proposed, but in light of the broad general entry reform of the legislation, they were more than adequate.

The legislation provided an even wider zone of pricing freedom than was proposed by the Administration, and it was a zone relating to ultimate lawfulness, not just to suspension. Only with respect to rate bureaus was there some compromise. The Administration bill had proposed abolishing all collective ratemaking, but the legislation ended immunity only for single-line rates, and this was done on a delayed basis. Again, however, in light of the tremendous entry liberalization and the new surge of competition once the restriction removal took place, the rate bureau question was somewhat less important. It becomes very difficult to maintain a strict cartel if the membership is constantly changing.

Certain provisions were not in the legislation. Unfortunately, the safety title did not survive, and an independent effort to pass it in the last Congress failed, although it is quite possible it may be reintroduced. Also "missing" from the legislation were labor protection and certificate buy-out provisions. That the legislation passed at all is surprising in light of the opposition. That it passed without some financial provisions for labor and the truckers is miraculous. The outcome might have been quite different had the ATA or Teamsters decided to introduce a real compromise bill instead of simply opposing reform. There is little question that the opposition grossly miscalculated the possible success of the reform movement. Had their calculations been better, they might have attempted to develop a more factual basis for their attack instead of relying purely upon public relations and a compromise strategy.

Assessment

It has been less than a year since the passage of the Motor Carrier Act, so it is difficult to make anything more than an initial assessment. The task is also complicated by the fact that the ICC chairman instrumental in the passage and initial implementation of the Act has left, and the new membership of the Commission is now in doubt. The study commission that was provided for in the Act has only just begun to meet.

But with all these caveats in mind, it seems fair to say that the Motor Carrier Act has ushered in a new era of competitive trucking. Shortly after passage of the Act, meetings were held with many major shippers and truckers who were interested in being on the study commission. After some initial hesitancy, truckers admitted that they were filing unprecedented applications for nationwide authority and entering new areas. Shippers reported heavy competition for their business.

In December 1980, staff of the ICC made an initial assessment of the reform. Some of the highlights of this report indicate a dramatic increase in entry grants: 8,684 in fiscal 1978; 12,233 in fiscal 1979; and 21,464 in fiscal 1980. Over 1,000 of the 1980 grants were made to new applicants.

Certificate values in the tens of millions were written off by major trucking firms. There was a dramatic increase in rate activity, with a tendency toward cost-related discounting. There was an increase in independent actions. By October 31, 1980, over 300 private carriers had given notice to take advantage of the new intercorporate hauling provisions. The ICC embarked on a series of rulemakings to implement the Act. All in all, there had been many impressive developments.

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1. "Regulation of Passenger Fares and Competition and the Airlines," Ford Aviation Papers, ed. Paul W. MacAvoy and John W. Snow, American Enterprise Institute for Public Policy Research, Washington, D.C., 1977.

2. Statement of John W. Snow, Ford Papers; Statement of Linda Kamm before Subcommittee on Aviation of House Public Works Committee, June 17, 1977.

3. *A Revised Annotated Summary of the Arguments For and Against Regulatory Reform of the Domestic Airline System of the United States*, Ad Hoc Committee for Airline Regulatory Reform, February 1978; U.S., Congress, Senate, Committee on the Judiciary, *Civil Aeronautics Board Practices and Procedures: Report of the Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary of the United States Senate* ("Kennedy Aviation Report"), 1975.

4. "The Intrastate Air Regulation in Texas and California," Ford Papers, pp. 41-70.

5. "Air Service to Small Communities," Ford Papers, pp. 81-140.

6. "Do Recent Airfare Increases Mean that Deregulation Isn't Working?," Staff Paper from the Director, Office of Economics, to the Civil Aeronautics Board, January 23, 1980; Marvin S. Cohen, "Domestic Air Transportation in the Marketplace," Speech before New York Society of Security Analysts, New York City, January 23, 1981; "Success of Airline Deregulation," Staff Paper, Office of Regulatory Policy, Office of the Secretary, U.S. Department of Transportation, February 1981.

7. *Regulation of Entry and Pricing in Truck Transportation*, ed. Paul W. MacAvoy and John W. Snow, American Enterprise Institute for Public Policy Research, Washington, D.C., 1977.

8. U.S., Department of Transportation, Office of the Secretary, *Motor Carrier Reform Act*, December 1976.

9. Message of President Carter to the Congress transmitting *The Trucking Competition and Safety Act of 1979*, June 21, 1979; Testimony of Brock Adams, Charles L. Schultze, and Alfred E. Kahn before the Senate Committee on Commerce, Science, and Transportation, on *The Trucking Competition and Safety Act of 1979*, June 26, 1979.

10. *Pan American Bus Lines Operations*, 1 M.C.C. 190, 1936.

11. U.S., Department of Transportation, *In the Matter of Allstate's Transworld Van Lines, Inc.*, Publication No. MC 144009, October 1978.

12. U.S., Interstate Commerce Commission, Bureau of Operations, *Can They Do That?*, 1978.

13. Testimony of Neil Goldschmidt before the Senate Committee on Commerce, Science, and Transportation, February 26, 1980.

14. U.S., Department of Agriculture, *Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption*, Marketing Research Report No. 224, March 1958; U.S., Department of Agriculture, *Interstate Trucking of Frozen Fruits and Vegetables Under Agricultural Exemption*, Marketing Research Report No. 316, March 1959, and *Supplement*, July 1961.

15. W. Bruce Allen, *An Examination of Unregulated Trucking Experience In New Jersey*, University of Pennsylvania, Contract No. DOT–OS–70064, July 1978.

16. Terence A. Brown, *An Examination of Unregulated Shipper Associations*, Pennsylvania State University, Contract No. PS–90760, March 1980.

17. U.S., Congress, Senate, Committee on the Judiciary, *Federal Restraints on Competition in the Trucking Industry: Antitrust Immunity and Economic Regulation, Report of the Senate Committee on the Judiciary*, April 1980.

18. Testimony of Bennett C. Whitlock, Jr., and Frank E. Fitzsimmons before the Senate Committee on Commerce, Science, and Transportation, March 28, 1979.

19. Testimony of Charles L. Schultze before the Senate Committee on Commerce, Science, and Transportation, *op. cit.*; U.S., Department of Transportation, *The Cost Structure of the Trucking Industry*, by Richard Klem, 1973.

20. Daryl Wyckoff, *Truck Drivers In America* (Harvard University, 1979).

21. U.S., Department of Transportation, *Review of Studies of the Relationship Between Motor Carrier Economic Regulation and Highway Safety*, by Raven Systems and Research, Inc., October 1979.

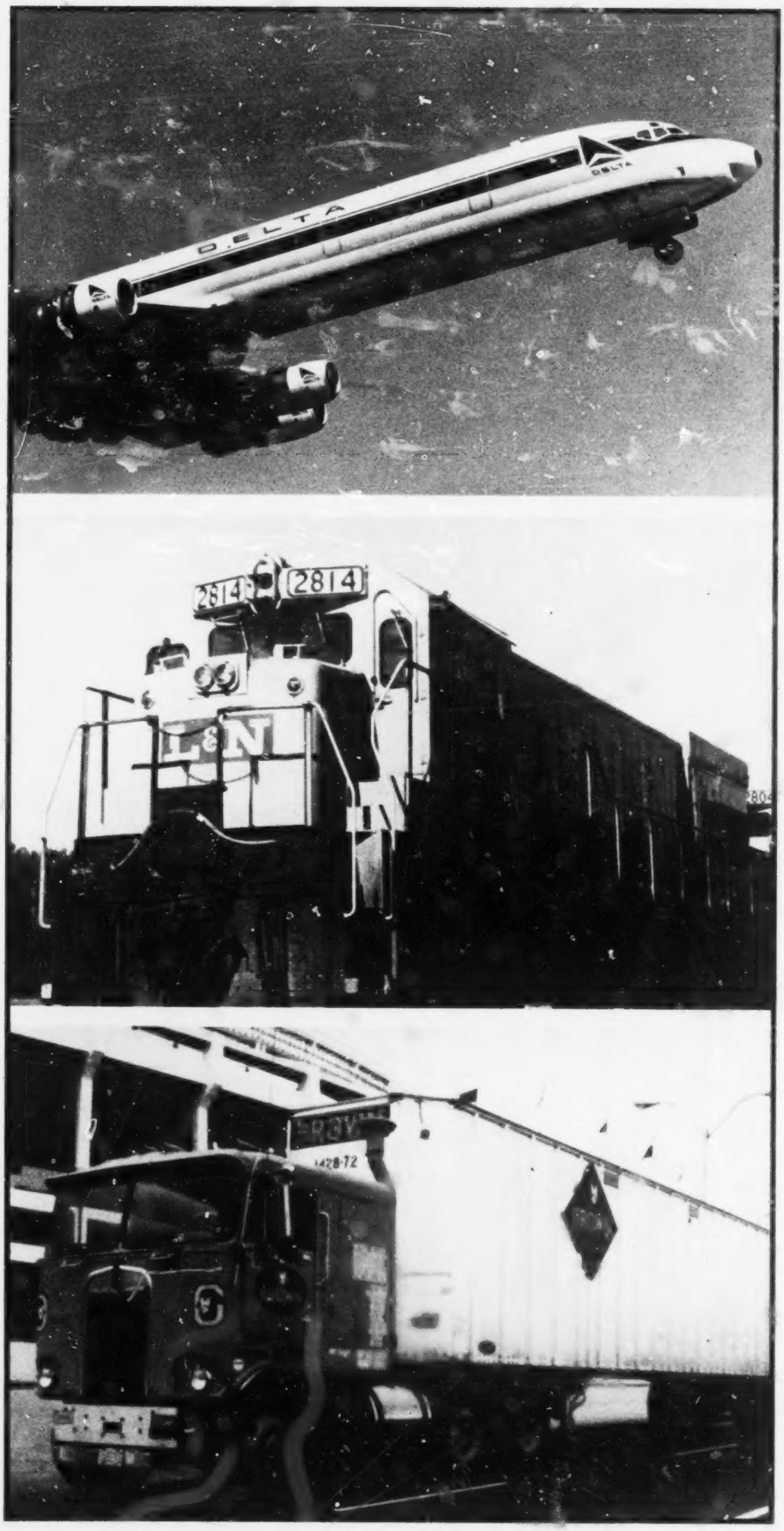
22. R. L. Banks & Associates, Inc., *Economic Analysis and Regulatory Implications of Motor Common Carrier Service to Predominantly Small Communities*, under Contract DOT–OS–50095, June 1976.

23. Policy and Management Associates, Inc., *The Impact on Small Communities of Motor Carrier Regulatory Revision*, prepared at the request of the Senate Committee on Commerce, Science, and Transportation, June 1978.

24. Denis A. Breen and Benjamin Allen, *Common Carrier Obligations and the Provision of Motor Carrier Service to Small Rural Communities*, Washington State University, Contract No. DOT–RC–82022, July 1979.

25. ________ , *Motor Common Carrier Freight Rate Study for Nine Western States*, Federation of Rocky Mountain States, Inc., Contract No. DOT– OS–40071, May 1975.

26. U.S., Department of Transportation, Office of the Secretary, Office of Transportation Regulation, *A Study of Trucking Service in Six Small Communities*, by Karen L. Borlaug *et al.*, November 1979.; U.S., Department of Transportation, Office of the Secretary, Office of Transportation Regulation, *Trucking Service in Two Small Michigan Communities*, by Karen L. Borlaug and Laurence T. Phillips, March 1980; U.S., Department of Transportation, Office of the Secretary, Office of Transportation Regulation, *Trucking Service in Two Small Alabama Communities*, by M. Dennis Marvich and G. Cleveland Thornton, March 1980; U.S., Department of Transportation, Office of the Secretary, Office of Transportation Regulation, *Trucking Service in Two Small Kansas Communities*, by Charles C. Orvis, March 1980. ■



Deregulation: Impact on Small Communities

Norman G. Paulhus, Jr.

Note: The opinions expressed in this paper are those of the author and do not necessarily represent the positions of the U. S. Government or the U. S. Department of Transportation. The author would like to thank Mr. David Tochen, Ms. Karen Borlaug, and Major John Hinchey, USAF, for their ideas and comments on topics covered in this article.

Background

In the late 1970's some of the most discussed, debated, desired, and dreaded changes in the workings of the U.S. transportation system began to occur. On October 24, 1978, the Airline Deregulation Act of 1978 (Public Law 95-504) was signed, placing added emphasis on the role of the marketplace in defining the scope and prices of intercity passenger service. Shortly thereafter, the motor carrier and rail freight industries were also the objects of far-reaching regulatory reform legislation. The Motor Carrier Act of 1980 (Public Law 96-296) was signed July 1, and the Staggers Rail Act of 1980 (Public Law 96-448) was signed on October 14 of that year. (This is in addition to earlier regulatory reforms in the air cargo area.)

Reaction to the changes has been mixed, ranging from enthusiastic support for lessened government intervention to concern that a host of smaller cities would lose their only access to needed transportation services. Typical of the latter viewpoint were concerns voiced earlier at a series of field hearings held by the U.S. Departments of Transportation and Agriculture during 1979 as part of the activities of a rural transportation advisory task force. The twelve hearings were held in agricultural production areas, and the emphasis of the sessions was, naturally, on problems of agricultural shipment. Those consulted ranged from federal, state, and local government officials to farmers, shippers, and the carriers themselves. During these proceedings, presenters discussed the regulation of truck and rail services more than any other issue. Even though transportation of unprocessed agricultural products was already exempt from regulation by the Interstate Commerce Commission, the final report from the task force included the following observation:

> Many people feared that sudden deregulation of either mode would be a tremendous shock to both agriculture and the transportation system. However, both users and providers suggested a need for review and liberalization of the current regulatory system.[1]

The opinions expressed for truck and rail freight service were also voiced in other forums about passenger air service to small communities. However, now that all three regulatory reform measures have been in effect for some time, it appears that the changes which are occurring will not be cataclysmic for small communities, but in some instances will create some basic changes in the way they conduct their transportation business. This article will explore the potential impacts of these regulatory changes on smaller communities, and suggest some ways in which small communities might react to the changes.

Regulation and Low-Density Service

It is important to understand, first, why small communities are so strongly affected by regulatory change. All transportation networks consist of routes which operate at varying demand densities. From the standpoint of the carrier, the most desirable routes are those which enable him to provide the most revenue-producing transportation service at the least cost. Operationally, this translates into running larger vehicles, keeping them full of passengers or freight, and keeping them moving, with few intermediate stops. Put another way, other things being equal, low density operations tend to cost more and are less profitable than high density operations. Obviously, the size of the carrier has a lot to do with this, since a large shipment for one might be marginal for another.

Typically, larger operators serve many levels of demand density, collecting traffic on low density routes, consolidating it with other components of the trunk service on high density routes, and then distributing it over another set of low density routes. Since the vehicles are full on high density routes, they are, on a relative basis, more profitable than those on low density routes if the vehicles are running nearly empty there.

A successful network structure, in a regulated environment, includes enough low density elements to gather traffic for the trunk segments, which can then be operated as high density services. The overall network structure makes a profit, although some of its individual elements might not be quite as profitable as others.

Problems emerge when the revenues earned providing certain low density services are exceeded by the marginal costs of providing that service, as this reduces the profits that the entire network structure earns. The only way the carrier can compensate for this is to either abandon service on some of the unprofitable low density feeder routes, or raise fares or rates, if the local market will allow this. Without government intervention through the regulatory process, service to these low density areas may then either be terminated or become more expensive for potential users.[2]

The Changing Face of Rural America

The prospects for loss of service for rural American communities due to any cause would be a serious condition. However, the problem is compounded by recent demographic trends which have put added emphasis on the role of smaller communities in America. In the early 1970's, several researchers, notably Calvin Beale of the U.S. Department of Agriculture, pointed out that the well established trend of metropolitan growth had begun to reverse and growth in nonmetropolitan and rural areas had begun to accelerate, a trend subsequently confirmed by 1980 Census data. Preliminary counts show that population in nonmetropolitan counties increased 15.4 percent over 1970 levels, compared to a 9.1 percent growth rate in large cities and suburbs, and a 10.8 percent growth rate for the nation as a whole.[3] Conversations with people who settled in smaller communities indicated a variety of motivations for such a move: the less hectic, more personally-oriented lifestyle possible in a small town; concern over the ability of traditional large-scale institutions to deal with urban problems; and economic motivations linked to energy or manufacturing development in some smaller communities.

Nonmetropolitan growth is proceeding especially rapidly in the West, averaging 31.8 percent overall. Some areas show a growth rate above 50 percent, including western Wyoming, western Colorado, northern Arizona, most of Utah, all of Nevada, and the Sierra Nevada region of California. Energy and mining, settlement in resort and retirement communities, outmigration from cities into exurbs, and high birth rates seem to be principal causes of this growth. Although these trends were the most dramatic ones, every state except Rhode Island exhibited growth in nonmetropolitan areas.[4]

Availability of low-cost, high quality transportation service will be one of the key factors in determining whether the decentralization trend of the last decade will continue. Simultaneously, the proliferation of small city markets will require a basic rethinking of the way transportation providers serve low density markets. The increased importance of rural areas may in fact make service to these developing markets more lucrative. Fortunately, the

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framers of the deregulation measures have reflected these considerations in the packages. One of the key features in the measures is their incremental nature, allowing for market changes and service evolution as various elements of the statutes take effect.

Airline Deregulation: The Rise of the Commuters

A good example of incrementalism is airline deregulation, with features of the legislation taking effect over a ten year period. (There are current discussions about accelerating some parts of this schedule.) Service to small communities was in fact one of the key issues considered in the framing of the legislation. Deeming the public interest to require maintainance of a comprehensive and convenient system of continuously scheduled airline service for small communities, Congress provided in the Act for direct federal assistance where appropriate.

A key feature of the legislation is free market entry and exit, a provision which allows certificated or commuter carriers to enter or leave any markets based on economic attractiveness alone. This was intended to allow carriers flexibility in redirecting their routes to meet changes in demand, or to take advantage of new economic opportunities. However, to protect smaller communities, a guarantee of continued air service to many was also included. Eligible points, with all cities listed on air carriers' certificates at the time the legislation was enacted, as well as others that the Board designated using a formal set of criteria (14 CFR Part 270) were guaranteed air service for ten years. This guarantee includes cities at which certificated carriers have previously suspended service.[5]

For each of these cities, the Civil Aeronautics Board (CAB) was directed to establish, in consultation with the affected communities, a level of "essential air transportation," which the CAB must then arrange to maintain. Air carriers are required to give notice before reducing services below the "essential" level, at which point the CAB must find another carrier to provide the service. Until another carrier can be found to provide the service, the Board may require the original carrier to continue service for additional 30 day periods, with the federal government compensating the carrier for any losses incurred.

Under regulated service, three major types of air carriers operated: trunk carriers such as United, American, and Trans-World; regional carriers such as Southern, North Central, and Hughes Airwest; and a range of short-haul operators generally referred to as commuter or air taxi airlines. The CAB has stressed the role of these commuter carriers in providing "essential" air service when a trunk or regional carrier files a notice stating it intends to suspend service, and a small community would otherwise be left stranded. Some 555 points are currently guaranteed air service, with about 320 of these located in the contiguous 48 states and Hawaii. In 1980, the Commuter Airline Association of America (CAAA) indicated that some 70 percent of these cities were served by commuter carriers, with the commuters providing the only air service for 133 of these communities.[6] In addition, commuters provide service to virtually all of the essential air service points in the state of Alaska.

Commuter carriers are one of the most rapidly expanding segments of the air carrier industry, increasing from 160 in 1971 to 257 in 1979, serving 824 airports. A key role for these carriers under deregulation is provision of service to small communities when trunk or regional carriers have discontinued it. Past situations in which this has occurred have included the cases of Jamestown, North Dakota (Air Wisconsin took over when Northwest withdrew), and Newport News, Virginia (Henson Aviation, an Allegheny commuter, took over for Allegheny/U.S. Air and Piedmont).[7] During 1979, similar assumptions of essential service by commuters took place at 46 communities around the country. At the present time, 16 commuter carriers are being subsidized to provide service at 40 points in the continental United States. In all these communities, the commuter carriers were able to meet or exceed the levels of service formerly provided by trunk or regional carriers.

These impressive gains are all the more remarkable in light of the sometimes unfavorable conditions facing commuter carriers. In many instances, communities are slow to accept commuter carrier replacements for certificated carriers due to a perceived loss in status from the departure of a trunk or regional carrier. In addition, passengers are sometimes reluctant to board the smaller commuter aircraft because of fears about their safety.

In 1979, the first full year in which airline deregulation was in effect, commuter carriers grew as never before. The CAAA indicates that nearly 14 million passengers and 475 million pounds of cargo flew by commuter during the year, up 27 percent and 18 percent, respectively, from 1978. The commuter carriers also increased their fleet sizes substantially, now operating more than 1,600 aircraft. In a CAB action coupled with deregulation, the commuter carriers may also operate larger aircraft, with up to 60 passenger seats and 18,000 pounds payload capacity.[8]

Airline Service Impacts in Small Communities

The U.S. General Accounting Office (GAO) conducted a comprehensive review of the airline industry during 1979, focusing on changes occurring as a result of deregulation. Their report, released in September 1980, showed significantly increased traffic, a smaller increase in fares than in airline costs and consumer prices, a higher industry rate of return on investment, and improved productivity. Despite national increases in air service, however, not all areas benefited equally, and 13 states actually experienced a decrease in service. The study notes that some of this decrease was not a result of deregulation. The only community which lost its "essential" air service during this period was Astoria/Seaside, Oregon, which, with the community's consent, lost its air service December 29, 1978. Service was reinstated at Astoria/Seaside

1980 Commuter Traffic Highlights

	1978	1979	Percent Change
Commuter Carriers[1]	228	237	+ 3.9%
O & D Passengers	11,026,000	13,972,000	+26.7%
Passenger Miles	1,278,500,000	1,724,000,000	+34.8%
Cargo (pounds)	401,000,000	475,000,000	+18.5%
Airports Served[1]	660	605	- 8.3%
Passenger Markets[2]	1,676	2,105	+25.6%
Total Markets Served[2]	2,393	2,450	+ 2.4%

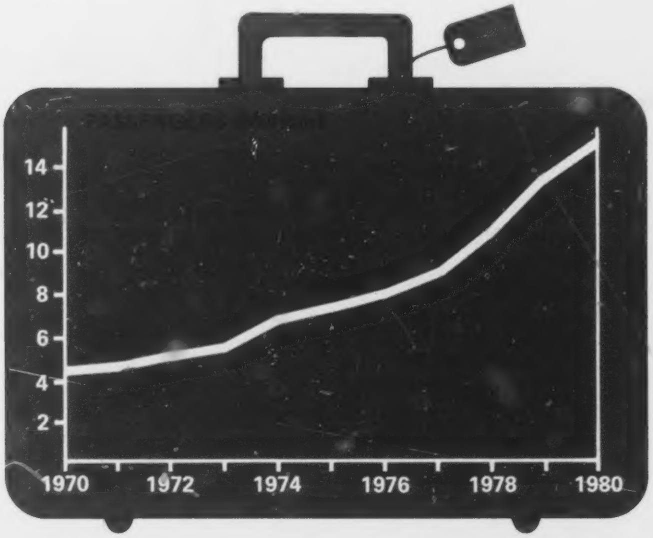
[1] Current count as of June 1980

[2] CAB reported statistics unadjusted for certificated commuter.

Source: CAAA

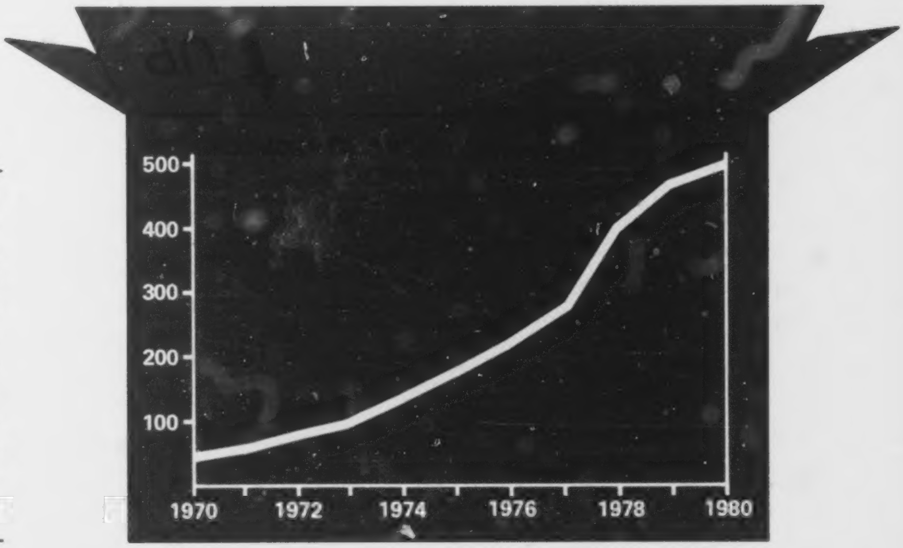
Commuter Passenger Traffic, 1970-1980

Year	Passengers Enplaned
1970	4,270,000
1971	4,698,000
1972	5,262,000
1973	5,688,000
1974	6,842,000
1975	7,243,000
1976	7,914,000
1977	9,185,000
1978	11,026,000
1979	13,972,000
1980(est)	15,500,000



Commuter Cargo Activity, 1970-1980

Year	Pounds (000 lbs.)
1970	43,527
1971	51,203
1972	74,573
1973	92,963
1974	138,279
1975	169,203
1976	216,811
1977	271,242
1978	401,638
1979(est)	475,000
1980(est)	500,000



on July 29, 1980, with the federal government subsidizing the service in accordance with the provisions of the Airline Deregulation Act. In contrast, some 137 communities lost air service during the ten years before deregulation. As of July 21, 1980, 22 of these communities had regained their air service, with commuter carriers providing most of this service on a nonsubsidized basis.[9]

The GAO study also found that the feared curtailment of service to nonhub airports simply was not materializing. As a group, nonhubs averaged a 16 percent increase in weekly scheduled departures between October 1, 1977 and October 1, 1979. However, direct nonhub-to-nonhub services are decreasing, and the study team conjectured this was resulting from an emphasis on "hub and spoke" network structures by CAB officials. In operational terms, this means more circuitous routing between small communities with travel through a hub airport almost a certainty.

In a September 1980 speech to the Airport Operators Council International, Marvin Cohen, CAB Chairman, commented on the impacts of deregulation up to that point. He felt that deregulation was actually improving service to some communities:

> "Since November 1970, smaller turboprop planes have replaced jet aircraft at 51 communities in the United States. This has usually meant an increase in flight frequency, a decrease in total seats, and a significant improvement in fuel efficiency. . . Particularly interesting is that, despite the shift from jet to turboprop, the average trip time from these cities has not increased but decreased slightly."

Mr. Cohen also noted that smaller cities which retained certificated service had also experienced service improvements. The certificated carriers were serving 217 more nonstop markets on August 15, 1980 than were served two years earlier.[11]

The takeover of routes in smaller communities by commuter carriers may result in an increase in service to major hubs, but it also means even more fragmented long distance travel, requiring a change to trunk or regional carriers, with the problems with ticketing and loss of baggage which can result.

Questions have also been raised about the safety records and schedule performance of commuter carriers. The Department of Transportation conducted a review of the effects of deregulation on air safety, dated January 1980. The study observed that the commuter airlines experienced one of the highest traffic growth rates during 1979, but their accident and fatal accident rates remained comparable to those of the previous four years. National Transportation Safety Board figures for 1980 later showed that commuter carriers experienced a 57% decrease in their fatal accident rate compared with 1979, possibly due to the Federal Aviation Administration's amendment of its primary regulation for commuter carriers, Federal Aviation Regulation Part 135.

The DOT safety study also concluded that, for commuter carriers engaged in passenger service, the largest operators had accident rates similar to those of local service airlines. However, the smaller commuter carriers showed accident rates significantly exceeding those of both larger commuter operators and local service airlines. The study found that commuter carriers providing passenger services have substantially lower accident rates than those conducting cargo or mail-only operations.

There do seem to be some safety implications associated with deregulation. During the first nine months of 1979, the new commuter airlines, and those which expanded rapidly during calendar year 1979, showed accident rates lower than those of operators who were conservative in their expansion. However, in the last three months of 1979, a different and somewhat disturbing trend began to emerge. Of the nine accidents occurring during that period, all but one occurred in carriers whose expansion had exceeded 25 percent. Whether this latter trend is spurious or will continue is unclear. However, the 1980 data implies that the trend is only temporary, especially considering the new commuter safety regulations.

The airline deregulation situation is still evolving. Many of the regional carriers are merging to become national trunks, the consolidation of North Central, Southern, and Hughes Airwest into Republic being a good example of this trend. Some major carriers are spinning off local service carriers to serve selected routes in high density markets, such as the formation of New York Air as a spinoff of Texas International. Many trunk carriers have been taking advantage of deregulation to extend into new markets, and competition is intense. A set of entirely new carriers, such as Midway and People Express, is developing, and a new class of interstate carriers such as Air Florida, Southwest, and PSA is also rising.

The economic situation will greatly influence the future of small community and other air service. According to the *Journal of Commerce*, 1980 was the first year in three decades in which trunk carriers as a whole ended up with an operating loss, amounting to $356 million.[13] Other sources indicate this figure may be somewhat conservative. According to George Dalley, a member of the CAB, the trunks suffered a 7 percent traffic decline and over $400 million in operating losses. Fuel costs appear to be a major factor in this decline. This is leading to some retrenchment in service, with the seat-mile figures for several major carriers down 6 to 9 percent over a comparable period in 1980. Under such economic pressures, there is little incentive to expand trunk service to growth centers until conditions improve. Tight capital could also constrain the ability of commuter carriers to add new hardware to serve developing small city markets. The availability of government guaranteed loans may lessen this squeeze somewhat.

Further hallmarks of airline deregulation include the phased "sunset" of the CAB, between now and 1985, with its small community functions transferring to the Department of Transportation. There are also some discussions of accelerating this process. The "essential service" guarantees will lapse in 1988, leaving carriers to operate in an essentially unregulated environment. Many changes are occurring in the airline industry, but the initial forecasts of trouble for small communities seem somewhat excessive when compared to the actual effects.

Motor Carrier Regulatory Reform

Although the Motor Carrier Act of 1980 has been in effect less than a year, it appears that the fears expressed before the passage of the legislation may also be somewhat overblown. The goals of the legislation include: meeting the needs of shippers, receivers, and consumers; allowing price flexibility; encouraging greater efficiency, particularly in the use of fuel; and providing service to small communities. The Act offers better entry opportunities for new carriers, and for the existing carriers to expand their service.

The House Committee on Public Works and Transportation expressed particular concern about the impact of the legislation on small communities and authorized a study of the impact of motor carrier deregulation on those jurisdictions, with special emphasis on small towns with a population of 5,000 or less. The Interstate Commerce Commission is required to file this report by September 1, 1981. Some of the comments at the time of the bill's passage indicated concern that the package might not have gone far enough to provide incentives to small community truck freight service.[14]

The study required by the Act is the most recent in a continuing series of investigations in this area. As early as 1977, the Senate Committee on Commerce, Science, and Transportation commissioned an independent study of the impact of motor carrier regulatory reform on small communities. The study concluded that the results of even total deregulation in the industry would be "surprisingly undramatic" for small communities, and for the most part would be similar to those felt by the economy at large. Some positive impacts were actually projected, including a decline in general rate levels, and an increase in the number of price and service options available to shippers.[15]

Although it is difficult to draw any sweeping conclusions yet about the impacts of motor carrier deregulation, there is a fair amount of empirical and analytical data which indicates the direction changes might take. For example, an October 1980 study conducted by Michael Pustay, John Drake, and James Frew of Purdue University attempted to examine the effect of federal trucking regulation on small communities by focusing on experience in the 1972-79 time period. The main focus of this work was on establishing whether or not such services could be profitable. The researchers logically assumed that if services were, in fact, profitable, carriers would be inclined to provide them whether or not regulation continued. They determined that the prices for operating rights in interstate markets, paid by the carriers to the Interstate Commerce Commission under a regulatory situation, provided a market-determined measure of the profitability of serving any particular route. The results suggested that much of the service to small towns and rural areas is, in fact, perceived as profitable by the carriers themselves. The researchers also speculated that relaxation of ICC regulation might lead to lower rates for rural freight service and possibly an increase in the quality of service. In this regard, it mirrored the earlier Senate Committee study.

The U.S. Department of Transportation's Office of Regulatory Policy also did several case study reviews of small community trucking services during 1979 and 1980. These studies found that ICC-regulated, general freight common carriers provided only a small percentage of the service to these towns. United Parcel Service (UPS) and private carriage were used most in the small cities studied. Since such carriers serve these small communities by design and choice, not because of regulatory requirements, it seems likely that regulatory changes should have little impact on the service to smaller jurisdictions.

Some idea of what an unregulated motor carrier environment might be like may be gathered from the experience of motor carriers in New Jersey. As research by Bruce Allen and others at the University of Pennsylvania has pointed out, New Jersey is almost a free market for motor carrier transportation. The state regulates only motor carriers of solid waste, household goods, and bulk commodities, and there has been little legislative pressure within the state to expand this regulation into other areas. Recognizing its urbanized nature, location (many trips are less than 200 miles), and dependency on manufacturing for its output, the New Jersey experience provides some interesting grounds for speculation.

Carriers in New Jersey are typically much smaller than the ICC certified carrier average, and tend to be healthier, as measured on an operating ratio basis. Shippers within the state also seem to like the unregulated environment, with some 91 percent of the large shippers who responded to a survey indicating they prefer it. Even smaller shippers share this preference, with 89 percent supporting the idea of keeping the state's motor carriers unregulated.

There may be simple economic reasons for this preference. The large shippers saved from 9.7 to 15.2 percent over what they would have paid in an ICC-regulated context, with small shippers saving from 8.5 to 11.4 percent. The study was able to determine the savings, but was not able to conclusively establish that the lack of regulation caused them. Service was also judged to be good, with 97 percent of the shippers contacted saying their service levels for intrastate shipments were better than or equal to those encountered in interstate service.[17] The New Jersey experience tends to support a belief that motor carrier freight service to small shippers can be maintained as regulatory change proceeds.

The issue of fees paid for operating rights, which are not needed in the new deregulated environment, still has to be resolved. Some carriers claim that regulatory reform has resulted in major financial losses for them, and have requested legislative relief. Some have proposed giving the carriers tax deductions to compensate for the lost value of these rights, but the final resolution of this issue is still unclear.

Rail Deregulation and Small Communities

One of the key factors motivating the development and passage of the Staggers Rail Act of 1980 was the financial plight of the U.S. railroads. At the time of the legislation's passage, a five-year capital shortfall of some 16 to 20 billion dollars loomed for the U.S. rail industry, and there was no evidence that the railroads could improve their earnings operating in a fully regulated environment. Shifts in the economy have changed the mix of commodities transported. Motor and water carriers, along with pipelines, have continued to take traffic away from the railroads, with the result that railroads carried 9.3 percent fewer tons in 1977 than they did in 1947. During this period, some 40 percent of truck inter-city ton miles and about 10 percent of the barge inter-city ton miles were regulated, while 100 percent of all railroad ton miles were regulated.[18]

Although coal transportation was not the stimulus for the Act, it was a major focus of some of the discussions prior to its passage. Coal is the number one commodity carried by the railroads, and as such the future of the West's new energy boom towns is intimately linked with the carriers. In 1978, coal accounted for 33 percent of tonnage, and 16 percent of total rail revenues. With the increasing emphasis on energy from coal, the need for investment by the carriers in new rolling stock and other facilities to transport it, and the concern of shippers about rate levels, became the major focuses of the regulatory reform proposal.

The Staggers Rail Act did not fully deregulate the rail industry, but provided increased latitude for carriers within a continuing regulatory structure. According to its framers, the Act's purpose is to provide rail carriers, through freedom from unnecessary regulation, the opportunity to earn the needed capital to restore physical facilities, while simultaneously achieving financial stability in the national rail system. Among other features, the Act assures the railroads substantially more freedom in setting rates than was accorded under existing law. Title II of the Act also encourages the railroads to contract with shippers. It also promotes efficient marketing through faster implementation of rates, and premium charges for better car service.

Section 401 of the Act authorizes a feeder railroad development program, which may assist smaller communities that are receiving inadequate rail service. In particular, the ICC may require a rail carrier to sell lines that are potentially subject to abandonment to a financially responsible person. Such a sale may also be required when service provided over a particular line is inadequate, with the burden of proof on the person filing to acquire the line. This program is limited until October 1983 to lines carrying 3 million gross ton miles per year or less. Thereafter, any line is eligible for acquisition under the program. The program is not intended to supplant existing branch line programs.

Section 402 of the Act supplements this provision by requiring railroads to sell lines approved for abandonment to financially responsible parties if they offer to pay the acquisition cost of the line or make up the difference between the revenues attributable to that service plus a reasonable return on the value of the line. Carriers petitioning for abandonment are to provide estimates of the minimum purchase price or subsidy required to keep the line in operation.

Shortly after the signing of the bill, Tom Kizzia of *Railway Age* magazine speculated on the impacts of deregulation. He projected that some freight rates would rise, but that overall improvements in the rail system's network structure and productivity, spurred by competition, should hold other rates down while improving service. However, he acknowledged that it would probably be at least four years before the accuracy of his predictions could be judged.[19]

Kizzia also projected marked increases in contract carriage shipments, particularly for small shippers. Under such arrangements, carriers enter into contracts with individual shippers to provide services that meet the specific needs of those shippers. There are statutory limits on contracts for agricultural and forest product shipments--not more than 40 percent of a carrier's cars by car type may be committed without a waiver from the ICC. Similarly, large agricultural shippers may contract for no more than 40 percent of their prior year's car demand without ICC approval in advance.

Rail industry support for these regulatory changes is widespread. Rail management feels that its role in deciding its own affairs has been substantially increased. Other speculation has focused on competition as a spur to innovations which improve productivity, possibly through technological or design improvements. With the regulation of the motor carrier and rail industries substantially reduced, intermodal competition between the two is expected to increase.

Even with new options for preserving service under the Act, it is probable that some communities served by light density rail lines will lose their rail service. Whether a shift to motor carrier operations, which can operate viably at some of these lower traffic densities, will occur in these areas is unknown. However, the Motor Carrier Act of 1980 allows truckers to begin service to towns where rail service has been abandoned, based only on fitness to provide this service.

Intermodal Issues and Shipper Associations

The abandonment of rail service in some light density areas may provide a spur to intermodal operations, the so-called "trailer on flat car/container on flat car" (TOFC/COFC) or "piggyback" concept. For light density areas where the commodities shipped are appropriate, railroads could abandon lines and substitute TOFC/COFC service. Rail shipments would thereby be taken to a central ramp facility instead of the shipper providing direct line access to the rail carrier. The shipment would then be unloaded and delivered by truck at its final destination.

Effective March 23, 1981, the ICC deregulated all rail and truck service provided by railroads for piggyback traffic (Ex Parte No. 230, [Sub.–5]). The Commission felt that there was no danger of the rail carriers engaging in discriminatory or anti-competitive practices. The trucking industry is concerned, however, that rail dominance of many markets will be a result, and such intermodal operations will force some motor carriers out of business.[20] TOFC/COFC is inherently competitive with single-line, truckload motor carriers. Whatever the outcome, deregulation has provided a spur to interest in the intermodalism of many carriers. Such options may provide new service opportunities to many small communities.

The intermodal prospects also dovetail well with another approach to forestalling increases in truck or rail rates: the formation of cooperative shipper associations in small communities. Simply put, a cooperative shippers association is a nonprofit organization whose members consolidate their small shipments into larger ones to get better freight rates. Although experience with these groups outside the agricultural area is limited, they appear to have a great deal of potential. The U.S. Department of Transportation has been sponsoring a series of workshops on the benefits, management, and maintenance of such associations.[21] The content of the workshops comes from research conducted by Dr. James H. Lemly at Georgia State and North Carolina State Universities. He examined a number of existing shipper associations serving retailers, wholesalers, manufacturers, and agribusinesses. Many of these operated with staffs of only one or two employees, and, besides consolidation, offered related services, including operating satellite and terminal warehouses, providing packaging services, auditing freight bills, routing, and giving legal advice to members. Lemly found that the concept was almost unknown to shippers in a 29-county area in Georgia which served as the base for the study's economic analyses, and presumably this is the case elsewhere.[22] Once more widely known, the shipper association appears to be one creative way shippers and businesses in small communities may improve their bargaining position in a deregulated environment.

. . . MANY OF THE FEARS OF LOSS OF SERVICE ASSOCIATED WITH REDUCED REGULATION MAY HAVE BEEN OVERSTATED. . . .

Conclusion

It is still too early to forecast long-term effects of these basic and far-reaching transportation reforms on small communities. However, it is clear that many of the fears of loss of service associated with reduced regulation may have been overstated, and originally unanticipated benefits may derive from the changes. The growth of smaller communities indicates a growing market for transportation services there, as well. Responding to the challenge of serving low density areas will require creativity on the part of the transportation industry, but initial indications are that this creative spark is at work.

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1. U.S., Departments of Agriculture and Transportation, "Agricultural Transportation Services: Needs, Problems, Opportunities," *Final Report of the Rural Transportation Advisory Task Force* (Washington, D.C.: Government Printing Office, January 1980), p. 9.

2. U.S., Department of Transportation, *A Rationale for Transportation RD and D Long-Range Planning*, by Jerry D. Ward (Washington, D.C.: Government Printing Office, July 1975), pp. 27-33.

3. U.S., Department of Agriculture, Economics and Statistics Service, *Rural and Small Town Population Change*, by Calvin L. Beale (Washington, D.C.: Government Printing Office, February 1981), p. 1.

4. Beale, p. 2.

5. Commuter Airline Association of America, *Creating A New Era: 1979 Annual Report, Commuter Airline Industry*, pp. 12-13.

6. Commuter Airline Association of America, *Decade of Decision: 1980 Annual Report, Commuter Airline Industry* pp. 20-21.

7. *Creating A New Era*, p. 11.

8. *Decade of Decision*, pp. 20-22.

9. U.S., General Accounting Office, "The Changing Airline Industry: A Status Report Through 1979," Report by the Comptroller General of the United States (Washington, D.C.: Government Printing Office, 1980), pp. 15-16.

10. "The Changing Airline Industry," p. 12.

11. "Deregulation: Setting the Stage for a New Era in Transportation," by Marvin S. Cohen, Chairman, Civil Aeronautics Board, September 1980.

12. Office of the Secretary of Transportation, "The Effect of the Airline Deregulation Act on the Level of Air Safety" (Washington, D.C.: Government Printing Office, January 1980).

13. "1980: Year of Losses for Trunk Airlines," *Journal of Commerce* (February 1980).

14. *United States Code, Congressional and Administrative News*, Legislative History, P.L. 96-296 (Washington, D.C.: Government Printing Office), p. 4163. (Additional views by Alan E. Ertel).

15. U.S., Congress, Senate, *Report to the Committee on Commerce, Science, and Transportation on the Impact on Small Communities of Motor Carriage Regulatory Revision*, June 1978.

16. U.S., Department of Transportation, *The Impact of Federal Trucking Regulation on Service to Small Communities*, by Michael W. Pustay, John W. Drake, and James R. Frew (Washington, D.C.: Government Printing Office, October 1980).

17. U.S., Department of Transportation, *Examination of the Unregulated Trucking Experience in New Jersey*, by W. Bruce Allen, Stephen Longeran, and David Plane (Washington, D.C.: Government Printing Office, December 1979).

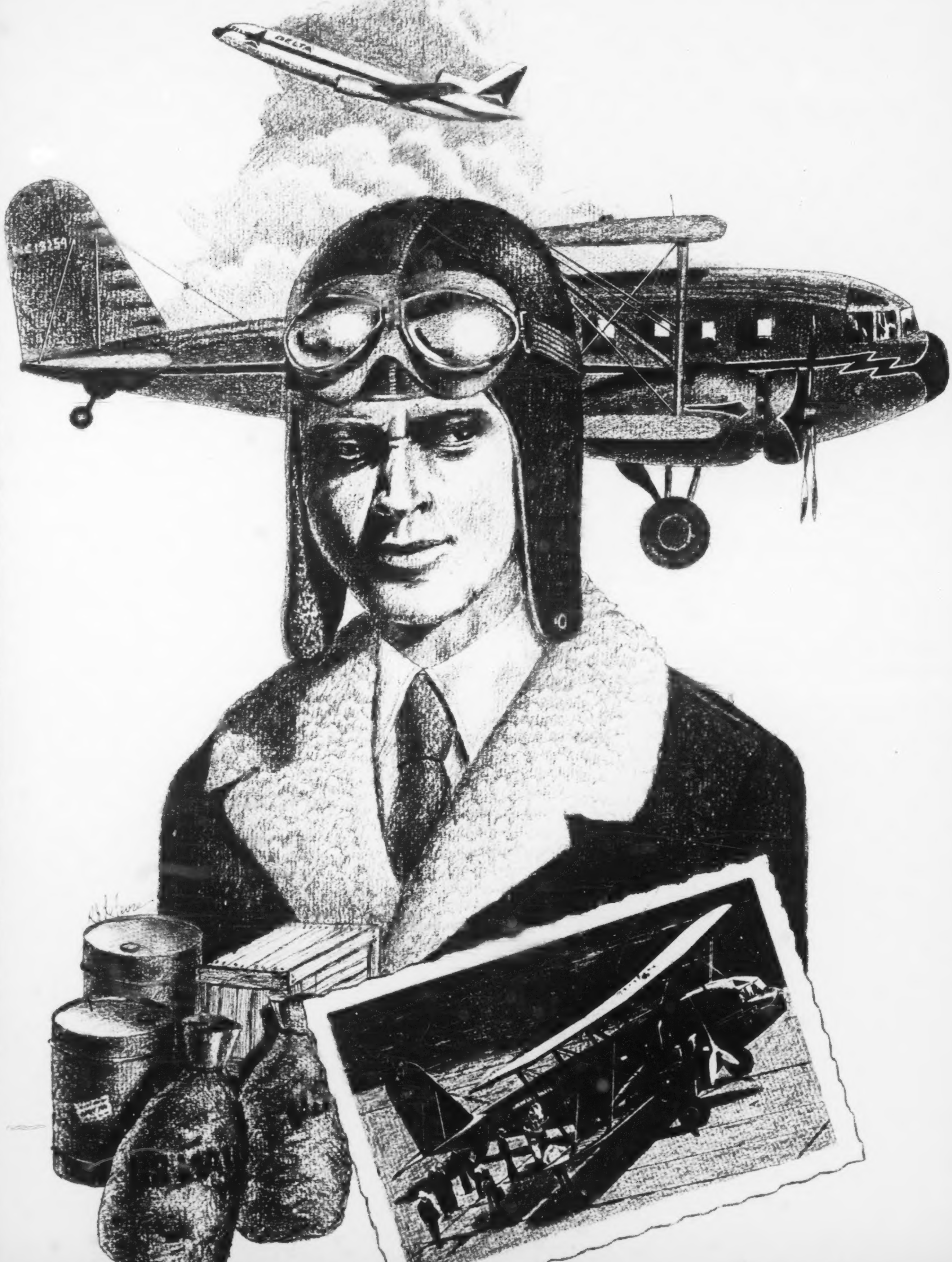
18. *United States Code, Congressional and Administrative News*, Legislative History, P.L. 96-448 (Washington, D.C.: Government Printing Office), p. 7390.

19. Tom Kizzia, "Watching Washington: A Big Year for Railroad Legislation," *Railway Age* 20 (October 1980).

20. "Congressional Intent: Ignored in Piggyback Decontrol, ATA Charges," *Transport Topics* (April 1981).

21. "Two Workshops Scheduled on Rural Transportation Shipper Cooperatives," *U.S. Department of Transportation News*, January 1981.

22. U.S., Department of Transportation, "An Evaluation of the Potential Ability of Geographically Based Shippers' Associations to Provide Benefits to Shippers in Low Traffic Density Areas of the U.S.," by Dr. James H. Lemly (Washington, D.C.: Government Printing Office, May 1980). ■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Impact of Airline Deregulation on Small Airports

Timothy L. Campbell

Introduction

Airline deregulation has had far-reaching and unanticipated impacts on the national aviation system. Airlines, passengers, and airports have had to adjust to the rapid and dramatic changes brought about by deregulation of the once highly regulated airline industry. Airport operations simultaneously soared and plummeted from 1978-1980, depending upon the size of the community.

The transition from full regulation to almost total deregulation has been painful for all participants in the air transportation system. Airports serving small and medium-sized communities (100,000 to 500,000 population) have been particularly affected by the changes brought about by airline deregulation. Once the protective covering of regulation was removed, small and medium-size cities were exposed to disproportionately higher airline fares, disruption of air service, and financial hardship resulting from declining airline service.

Historical Perspective

As with most federal regulations, the regulation of the commercial airline industry developed gradually beginning in 1926, with the passage of the Air Commerce Act, to the present Deregulation Bill passed in 1978.

The original Air Commerce Act of 1926 imposed safety regulations, but no economic regulations, on the airline industry. The industry at that time consisted primarily of contract mail carriers. Through competitive bidding, the Post Office Department awarded various mail routes to the then quite youthful airlines. Until the passage of the Civil Aeronautics Act in 1938, any person or company complying with the safety requirements of the Air Commerce Act of 1926 was at liberty to operate a commercial airline. The various air mail statutes enacted by the Post Office Department did, to some extent, control the pattern of competition among air mail contractors. However, there was little direct economic regulation until the Civil Aeronautics Act in 1938.

The 1938 Act replaced the Air Commerce Act of 1926 and consolidated the various air mail statutes, broadened the scope of safety regulations and subjected air carriers to the type of economic regulations normally imposed upon public utilities. It also established the Public Convenience and Necessity Certificate, which allowed the air carriers to transport persons, property, and mail only after the need for such authority had been established in public hearings.

Grandfather provisions permitted certificates to be issued to then existing air carriers. The Act also authorized subsidy assistance to air carriers in the form of mail pay, imposed control over rates, and established control over all relationships between air carriers as well as between air carriers and other forms of transportation. Under the grandfather clause, the airlines became what are now known as the trunkline air carriers, which conduct long-haul passenger and cargo operations over the primary air routes in the country. The certificate provisions have been used to authorize new air carriers such as the local service (or feeder) airlines, helicopter operations, and supplemental air carriers.

Originally, the Civil Aeronautics Act of 1938 was administered by three groups. A five-member Civil Aeronautics Authority exercised judicial and legislative functions over the act; a three-member Air Safety Board was responsible for investigating aircraft accidents and making recommendations designed to eliminate future accidents; and the third group, the Civil Aeronautics Administration, developed civil airways, landing areas, and other air navigation facilities. In 1940, the Air Safety Board was abolished and its functions transferred to the five-member Authority, which was redesigned and redesignated as the Civil Aeronautics Board. The Civil Aeronautics Administration, or CAA, later became the Federal Aviation Agency and was placed under the Department of Commerce.

The respective duties of the Board and the Administrator were outlined in the reorganization plans of 1940. The Board operated as an independent regulatory commission similar to the Interstate Commerce Commission, Federal Communications Commission, and Federal Power Commission, although organizationally it was placed within the Commerce Department. In 1958, the Board was officially designated as an independent agency, with the Federal Aviation Agency considered an executive agency.

Under the 1938 Act and subsequent reorganization plans, the Board's functions dealt primarily with the following: (1) regulation of the economic aspects of U.S. air carriers, including the fixing of rates, controlling of interlocking relationships, controlling abandonment of services, and insuring adequate service; (2) controlling entry of foreign air carriers into the United States; (3) promulgation of safety standards for aircraft; (4) suspension and revocation of safety certificates; and (5) investigation of aircraft accidents.

In 1958 and 1967, the changes brought about by the creation of the Department of Transportation essen-

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tially stripped the Board of its safety functions, which were transferred to the Department of Transportation and, more specifically, to the Federal Aviation Administration, the successor to the Federal Aviation Agency. The Board's economic regulatory powers remained and the primary functions of the Board continued until the changes brought about by airline deregulation in 1978.

The development of the Civil Aeronautics Board from 1938 to 1978 reflects the intent of Congress to treat commercial aviation as a form of public utility in which the members of the Board should consider, among other things, the public interest in accordance with public convenience and necessity. Throughout the act the Board was required, as a prerequisite to any action, to find either "public interest" or "public convenience and necessity." In issuance of Certificates of Public Convenience and Necessity, the Board set forth the specific terminal and intermediate points that could be served by the certificate holder. This established the route patterns of the carriers that developed over the years. The act contained specific procedures for adding or deleting service points and also offered route protection to carriers holding specific route certificates. The Board also required that air carriers file a tariff of fares to the points served as well as provide transportation authorized by its Certificate to provide safe and adequate service and establish just and reasonable joint fares.

In the early days of fairly simple regulatory requirements, the Board developed a complex and often time-consuming set of rules and procedures for implementing the regulations. The introduction of jet aircraft into the national transportation system in the late 1950's revolutionized the air transportation industry and led to accelerated growth through the 1960's and up to 1970. The rapid expansion of airline service into all parts of the country and the increasing importance of airlines in the national transportation system created pressures and requirements to which the complex rules and regulations promulgated by the CAB did not readily adapt. In the early- to mid-1970's, there developed a growing awareness of the overly burdensome CAB regulations, cumbersome procedures, lengthy delays, and great expense of making changes in air carriers' route systems.

The growing consumer movement in the 1970's gave expression to a concern with the price of air fares, which were felt to be excessive because of a lack of competitive pressures to hold air fares at a minimum level. Airline deregulation legislation, primarily as a consumer-oriented bill, was introduced by Senator Edward Kennedy. The purpose was to lower air fares, thus making air travel available to all economic groups. Senator Cannon picked up the issue along with Senator Kennedy, and after numerous public hearings and debates, Congress finally adopted the Airline Deregulation Act of 1978.

The Aftermath: 1978 Through 1981

The combination of airline deregulation in October of 1978 and rising fuel prices brought rapid changes to the national air transportation system. Major changes appeared in the national route system flown by the air carriers, the fares charged in different city-pair markets, and in the air service and fare levels at small and medium-sized airports. Many of the large trunk carriers, such as United Airlines, American Airlines, and Trans World Airlines, initiated immediate changes in their route systems after the passage of deregulation. The impact of deregulation on Knoxville outbound service is illustrated in Table 1. Almost all of the trunk carriers began to withdraw from small cities and reorganize their route system to fit into a hub-and-spoke system similar to that operated by Delta Airlines at Atlanta.

The trend in route system development towards hub-and-spoke operation is continuing in the industry today, and, if anything, is accelerating. The regional carriers, such as USAir (formerly Allegheny Airlines), Piedmont and Republic, are following a similar trend. There are a few regional carriers, however, such as Piedmont Airlines, which are bypassing large, congested hubs by offering direct point-to-point service in addition to hub-and-spoke operations.

The advantage of the hub-and-spoke concept, where the airlines feed through a central hub, is that the airline can "capture" the passenger all the way through to his destination. With limited aircraft availability, it is impossible for each airline to fly to each city in the U.S. With a hub-and-spoke system, however, it is possible to provide service to an increased number of points with fewer aircraft and also "through ticket" the passenger. This increases the revenue to the carrier by keeping that passenger on-line, thus preventing his transferring to another airline. Many of the large trunk carriers which reduced or eliminated service at small and medium-size cities immediately after deregulation are now reconsidering their philosophies because they have lost the feed traffic provided from those smaller cities into the hub complexes. American Airlines, for instance, is now reconsidering additional service to small and medium-size cities to improve the feed through its hub system at the Dallas/Ft. Worth Airport. The regional carriers, such as USAir and Piedmont, have been successful in providing service at medium-sized cities, feeding through the hub system and thus taking business away from the trunk carriers.

Another development in the national route system resulting from airline deregulation is the rising importance of commuter airlines, which fly aircraft of 60 seats or less. Deregulation has provided an opportunity for these airlines to greatly expand their route systems as the regional and trunk carriers withdraw from small city markets. Commuter airlines are primarily designed to serve short-haul markets, 250 air miles or less, because the aircraft are small and fly at slower speeds. These lines have become increasingly important to the national air transportation system by connecting small cities that have lost all, or the bulk of, their large airline service. The commuter operator generally provides greater frequency of service, since the number of seats per aircraft is small, resulting in greater convenience to the small city traveler.

Many communities have been reluctant to accept commuter airlines because of the small aircraft and public misconceptions about the safety of these aircraft. Small communities, where large jet service has been replaced by commuter airlines, have found that the public requires education and familiarization with the commuter operator, the type of aircraft, and the advantages offered by commuter airlines.

USAir has had a subsidiary commuter operation for many years. The Allegheny commuter lines provide access to large-city airports from many small communities in the Northeast and Mid-Atlantic States. USAir benefits from this commuter network by being able to carry these passengers through to their final destinations after connecting from an Allegheny commuter. The commuter line receives the benefit of the larger airline's ticketing, computer reservation system, advertising, and promotional assistance.

One of the primary purposes of airline deregulation was to benefit consumers by reducing fares. Airlines have found, however, that rapidly rising fuel costs have necessitated large increases in fares over the last two years. Airlines are fuel-intensive; the cost of fuel as a percentage of total operating cost (and simultaneously, the cost of a ticket) has more than doubled due to OPEC's manipulation of oil prices. While fares have generally increased, some markets have enjoyed significantly reduced fares and substantial discounts as a result of increased competition brought about by deregulation. Other markets have found that their fares have increased disproportionately to average fares in the country because of the *lack* of competition, particularly in monopoly or single-carrier markets serving small and medium-sized communities.

The summer of 1980 witnessed the "fare war" in the transcontinental market between New York, Los Angeles, and San Francisco. At times the fares were as low as $129 one-way between New York and Los Angeles as Eastern Airlines attempted to penetrate the transcontinental market. Other carriers matched this extremely low fare to avoid loss of market share to Eastern Airlines. While consumers in large-city markets benefited from this increased competition and discount pricing, passengers in medium-sized and small cities did not. Airline fares were increased in these markets to help offset the operating losses being experienced in the transcontinental markets where the deep discount fares were being offered.

Airline deregulation has also allowed new airlines to be created and organized to provide increased competition with incumbent carriers. New York Air, People's Airway, and Muse Airlines are but a few of the new airlines either already formed or developing. These airlines are designed to serve specified markets, primarily between large cities. For example, New York Air's service between New York and Washington, D.C. and New York and Boston provides direct competition with Eastern Airlines' shuttle service. These new carriers generally are non-union and have limited customer services and small route systems, all resulting in lower operating costs. While they have the effect of reducing air fares in those markets in the short term, their long-term impact has yet to be determined. The incumbent carriers must match the lower fares offered by

TABLE 1
IMPACT OF DEREGULATION ON KNOXVILLE, TENNESSEE OUTBOUND SERVICE CARRIER ANALYSIS

	Total				Percent Change				
Statistic	01/78	11/78	11/79	11/80	01/78-11/78	11/78-11/79	11/79-11/80	01/78-11/80	11/78-11/80
American									
Weekly Departures	14	14	14	13	0.0	0.0	-7.1	-7.1	-7.1
Weekly Seats	1603	1610	1806	1677	0.4	12.2	-7.1	4.6	4.2
Average Seats/Flight	114.5	115.0	129.0	129.0	0.4	12.2	0.0	12.7	12.2
Nonstop Markets	1	2	2	2	100.0	0.0	0.0	100.0	0.0
Delta									
Weekly Departures	104	111	104	91	6.7	-6.3	-12.5	-12.5	-18.0
Weekly Seats	11847	12120	11896	11236	2.3	-1.8	-5.6	-5.2	-7.3
Average Seats/Flight	113.9	109.2	114.4	123.5	-4.1	4.8	7.9	8.4	13.1
Nonstop Markets	6	6	7	6	0.0	16.7	-14.3	0.0	0.0
Piedmont									
Weekly Departures	27	27	13	7	0.0	-51.9	-46.2	-74.1	-74.1
Weekly Seats	1566	1566	754	406	0.0	-51.9	-46.2	-74.1	-74.1
Average Seats/Flight	58.0	58.0	58.0	0.0	0.0	0.0	0.0	0.0	0.0
Nonstop Markets	4	4	2	1	0.0	-50.0	-50.0	-75.0	-75.0
Republic (Southern)									
Weekly Departures	32	25	25	26	-21.9	0.0	4.0	-18.8	4.0
Weekly Seats	2560	2000	2000	2276	-21.9	0.0	13.8	-11.1	13.8
Average Seats/Flight	80.0	80.0	80.0	87.5	0.0	0.0	9.4	9.4	9.4
Nonstop Markets	3	3	3	3	0.0	0.0	0.0	0.0	0.0
Transworld									
Weekly Departures	0	0	7	0	0.0	+	-	0.0	0.0
Weekly Seats	0	0	574	0	0.0	+	-	0.0	0.0
Average Seats/Flight	0.0	0.0	82.0	0.0	0.0	+	-	0.0	0.0
Nonstop Markets	0	0	1	0	0.0	+	-	0.0	0.0
United									
Weekly Departures	[illegible]	[illegible]	[illegible]	27	-7.6	-19.7	-44.9	-59.1	-55.7
Weekly Seats	[illegible]	[illegible]	[illegible]	2732	-8.3	-19.9	-44.0	-58.0	-56.1
Average Seats/Flight	[illegible]	[illegible]	[illegible]	101.2	1.4	-0.2	1.8	2.7	1.3
Nonstop Markets	6	7	5	3	16.7	-28.6	-40.0	-50.0	-57.1
Weekly Departures	[illegible]	[illegible]	[illegible]	164	2.3	-10.2	-22.4	-28.7	-30.3
Weekly Seats	24107	[illegible]	[illegible]	[illegible]	-2.8	-6.3	-15.3	-22.7	-20.7
Average Seats/Flight	98.7	98.2	93.1	101.8	-4.8	4.3	9.1	8.4	13.8
Nonstop Markets	18	19	18	13	5.6	-5.3	-27.8	-27.8	-31.6

Explanation of Percent Changes Symbols: 33.3 – Normal Percent Increase; -33.3 – Normal Percent Decrease; + – New Service Instituted; – – All Service Discontinued.

Prepared by: [illegible] & [illegible], Inc.; Computer Applications and Services Division; Alexandria, Virginia.

Source: Official Airline Guide. Based on schedules in effect on the first of each analysis month.

the new airlines and, in order to make up for the operating cost differences, fares in other markets must be raised to maintain the airline's overall profitability.

Airline deregulation, at this time, seems to be working to the advantage of consumers in large urban areas and to the disadvantage of small and medium-size communities. The impact on smaller communities has been significant and, with a few exceptions, their air service is poorer today than it was before deregulation.

Small-hub Airport Problems

Small and medium-sized communities' airports generally fall into the small-hub category, enplaning 1-2.5 percent of all passengers nationally. Such airports are usually operated by a local city, county, or, in some cases, an airport authority. Knoxville's McGhee-Tyson Airport fits into this category: it is one of the larger small-hub airports, enplaning 460,000 passengers in 1979 and 430,000 in 1980. The experience at McGhee-Tyson is representative of the experience of small-hub airports nationally.

During the period after deregulation, from November 1978 through November 1980, McGhee-Tyson Airport experienced a 30 percent decline in the number of weekly airline departures. It also experienced a 21 percent decline in the number of weekly seats, and the number of nonstop markets served declined 32 percent. The only increase has been in the average number of seats per flight, which has grown 14 percent due to Delta Airlines' replacing DC-9 service with larger capacity 727 aircraft. Of the five airlines serving McGhee-Tyson Airport, only one, Republic, has shown an increase (4 percent) in weekly departures. American Airlines has decreased weekly departures by 7 percent, Delta by 18 percent, Piedmont by 74 percent, and United Airlines by 56 percent.

While other small-hub airports are not served by as many airlines as is Knoxville, the overall trend toward decreased weekly departures, weekly seats, and nonstop markets served is consistent with the data for Knoxville, which is shown in Table 1. In Tennessee, for example, only Clarksville, Memphis, and Nashville experienced an increase in scheduled departures. During the period March 1978 through March 1980 Tri-City Airport showed a 32 percent decline in weekly departures; Chattanooga, 33 percent; Jackson, 73 percent; and Knoxville, 20 percent. A majority of Tennessee airports also showed a decline in scheduled seats per week, with Tri-City showing a 14 percent decline; Chattanooga, 41 percent; Clarksville, 70 percent; Knoxville, 26 percent; Memphis, 15 percent; and Nashville, 7 percent over the two-year period. These data are provided in Table 2.

Small-hub airports are finding an increasing number of commuter airline operations at their facilities. In Knoxville, the number of commuter airlines has grown to two, Tennessee Airways and Scheduled Skyways. Both offer service to Nashville, with Skyways going on to Memphis and Little Rock, Arkansas, while Tennessee Airways offers service to Charlotte, North Carolina. This trend is emerging throughout the country as commuter airlines begin to fill the gap in service from small- to large-hub airports for connecting service to other destinations. Connecting traffic, in which a change of planes and airline is required, is considered a reduction in air service convenience compared to the on-line or direct service offered more extensively prior to airline deregulation. From small-hub airports, where larger carriers have continued service, the trend toward hub-and-spoke operation generally necessitates a change of plane or, at least, an additional stop not experienced prior to deregulation, resulting in an overall reduction in convenience to the small-community air traveler.

Disproportionate increases in airline fares from small-hub airports have become common throughout the country. Most small-hub markets are served by only one airline because they do not generate sufficient air traffic to justify more than one carrier. There is no competition to provide a market mechanism for controlling fares. Many airlines are cross-subsidizing discount fares in large markets, where competition does exist, with higher fares in small markets to help offset operating losses generated by the discount fares. The Civil Aeronautics Board, while maintaining some oversight of fares, has allowed carriers considerable upward flexibility in this cross-subsidization. Consumers in small and medium-sized cities are not only experiencing a reduction in the level and convenience of air service offered from their airports, they are also paying a premium price for this reduced service.

There is no question that fuel price increases have required the airlines to increase their fares, but it is readily demonstrated that the fares for small-hub markets have increased disproportionately to those for large city markets. In September 1980, the unrestricted coach fare between New York and San Francisco was $129; the fare between Knoxville and San Francisco was $314. Flying distance between New York and San Francisco is 2,576 air miles, with the $129 fare yielding 5¢ per mile to the airline. The distance from Knoxville to San Francisco is 2,122 miles, with the $314 fare yielding 15¢ per airline mile. While it might be expected that the fares would be somewhat higher from small communities because of higher operating costs for one-stop service as opposed to nonstop service, three times the average per-mile cost is disproportionate and cannot be justified by the increased operating cost of serving small communities.

The negative impact of airline deregulation on small community air service and fares has caused hardship for airport operators and the community served by the small-hub airport. As airline departures have declined at the small-hub airports, passenger volume and revenues have also declined. High airline fares from small communities have discouraged air travel from these communities and, in many cases, have forced business travelers to seriously consider alternative modes of transportation, primarily the private automobile, over short distances.

Small-hub airport operators have found that airline deregulation and the resulting impact on service have created severe financial hardships for the airport and, in some cases, have required community taxpayer assistance to continue to maintain and operate the airport. Airport operators derive revenues from a number of sources, including landing fees and terminal building rents paid directly by the airlines. As departures have decreased and airlines have withdrawn from markets, these revenues have naturally declined. Other revenue-producing sources at small-hub airports include concession revenues from rental cars, restaurant, and parking operations. Areas in which revenues have increased over the past several years are fuel flowage fees and fees recovered from general aviation aircraft, primarily business and corporate use of the airfield. Many companies have begun to purchase aircraft for business travel, since this is the only way they can have access to many of their market areas because of reduced airline service. Airport operators derive revenues from general aviation traffic through fuel flowage fees and ramp and hangar rentals. The contribution of general aviation to the overall revenues at an airport is generally in the neighborhood of 5 percent, a relatively small revenue source for most small-hub airports.

In addition to the normal escalation of operating costs small-hub airport operators have found, because of deregulation, that they are now spending considerable sums on promotion and marketing. The competition among airports for air service is tremendous, and almost all small-hub airports have retained the services of an air service development consultant to improve their air service patterns.

The indirect financial impact on the community served by the small-hub airport is less easily measured, but is substantial. Chattanooga, for example, lost several large industrial relocations when a number of industries which were ready to move to the Chattanooga area indicated that, because of the declining airline service offered, they had decided not to locate in the area. Communities with poor airline service are at a competitive disadvantage for new industries. This may cause a shift away from locating plants and industries in smaller communities and cause industry planners to consider expansion and relocation in large urban areas where air service patterns have improved as a result of deregulation. The decision of industry to remain in large urban areas can only exacerbate the problem.

In addition to loss of new industry, the disproportionately higher airline fares and poorer service impede businesses and industries already located in smaller communities because of the increased cost of doing business. The businesses and industries are at a competitive disadvantage with those located in large urban areas with convenient and less costly airline service. As transportation costs increase as a proportion of total operating cost due to rising energy prices, this competitive disadvantage will be magnified in years to come.

Future Impact of Airline Deregulation on Small Airports

Airlines are still adjusting to the new rules of the game set down by deregulation. It can be expected that this adjustment period will continue for the next several years before the industry stabilizes, probably in 1983 or 1984. Most experts predict that there will be fewer airlines, perhaps four or five large carriers, formed as a result of mergers, bankruptcies, and discontinuance of some airlines altogether.

Several other factors enter into predicting the future of airline service, particularly in small communities. Capital formation will be a major concern to airlines over the next several years as they attempt to replace their aging fleets of aircraft with more fuel-efficient, larger-capacity airplanes. Noise regulations at large airports may reduce the airline service at these large-hub facilities. National Airport in Washington, D.C., O'Hare in Chicago, and LaGuardia and Kennedy in New York are already restricted by a Slot Quota System as to the number of hourly operations which can occur. The FAA is considering further reduction in Slots at Washington's National Airport. Small community service would probably be affected if capacity at large airports is reduced in the coming years.

Air service at the larger small-hub airports probably will show signs of improvement over the next several years as regional carriers and some trunk airlines begin to develop their feed system through hub-and-spoke operations. Air passengers in larger small-hub communities will benefit from this improved service. Very small airports will probably continue to experience severe air service disruptions and come to rely on commuter airline service to provide access to the national air transportation system. Fares will continue to be high at the majority of small-hub airports because of the lack of competition in the markets served from these cities.

There is a growing movement to re-regulate the industry in some fashion to alleviate problems which have developed, particularly in small and medium-sized communities. Legislation has been introduced by Tennessee's Senator James Sasser which would provide for an increased notice period before carriers could depart from a market, provide fare oversight in monopoly markets, and provide loan guarantees for commuter aircraft with 55 passengers or less. The current mood in Congress is certainly pro-deregulation, but many small communities have experienced severe air service dislocation and their congressmen are sensitive to the problems created by rapid transition from a high degree of regulation to almost total deregulation in such a short period of time.

The debate over airline transportation as a public utility or a private industry will continue. It would seem that a combination of private industry market forces and public utility protections might address the problems experienced by small communities and still provide for competition in larger markets. Corrective legislation, addressing the need for fare and route protection in small and medium-sized communities, while providing for competitive market force controls in large cities, will probably be introduced within the next five years as the industry begins to stabilize and the impact of deregulation is more fully understood. ■

Energy and the Tennessee Economy

Stephen P. Coelen

For Tennessee, energy has become as important a factor as it has for the nation and the world. This fact was clearly marked by the 1973 oil embargo and the formulation of effective energy pricing strategies by the Organization of Petroleum Exporting Countries (OPEC). Effects of the so-called "energy crisis" on the economy have been profound, effecting dramatic increases in the cost of living, decreases in labor productivity, and deterioration of the U.S. balance of payments. To the state of Tennessee, the energy crisis has brought occasional gasoline shortages, one period of serious natural gas unavailability, and perhaps most crucially, it could bring a shift in the long-run competitive position of Tennessee vis-a-vis the rest of the U.S.

This article, focusing on the energy situation in Tennessee, puts a spotlight on the fuel mix problem. It provides a general introduction to a series of questions: How much energy do we use? When have observed energy trends changed directions? Why do we use the kinds of fuels that we do today? Where will we go in the future if energy becomes more scarce than it was in the past? Answers to these questions and more are necessary to plan properly for an uncertain future. This article can at best be only an introduction to the answers to these questions, not even attempting to provide complete responses to such complex issues.

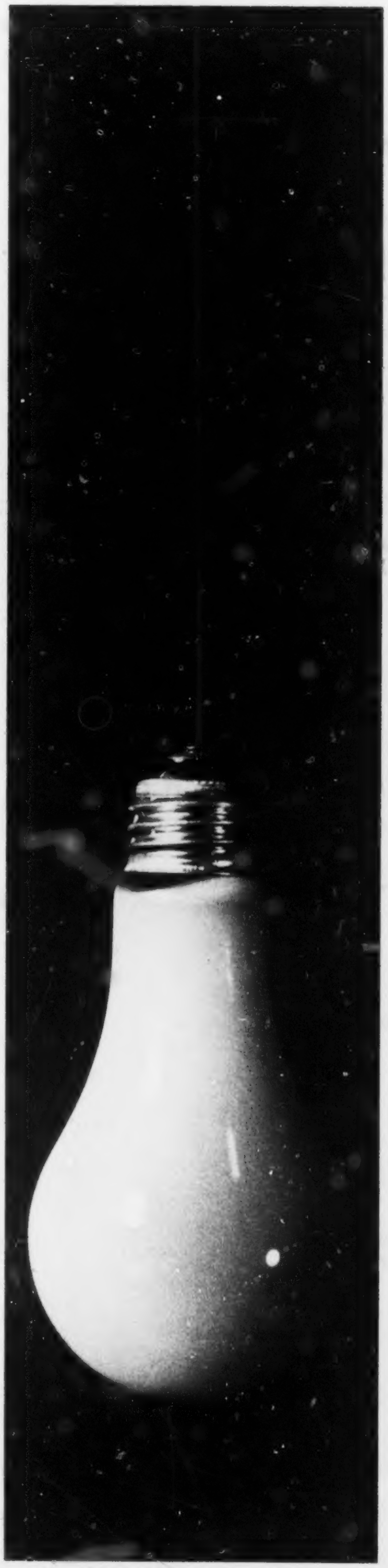
Energy and Tennessee "Sunbelt" Growth

The energy crisis has been both good and bad for the southern part of the U.S. On the fringe of the Sunbelt, Tennessee has had a compound annual average rate of growth in population of 1.58 percent (from 1970 to 1980), well above the U.S. average of 1.09 percent. A forthcoming report of the federal Bureau of Economic Analysis suggests no intermediate-term decrease in this greater relative Tennessee growth. In the period through the year 2000, in fact, the Tennessee growth rate is forecast to be more than 50 percent greater than the U.S. rate. Of course, this difference is due to a significant rate of migration into Tennessee. However, according to many analysts, at a more basic level of explanation, the migration is attributed to job availability. Ultimately, these analysts argue that the growth can be traced to Tennessee's production of the inexpensive electrical energy that is now and may continue in the future to be cheaper and more abundant than in the nonsunbelt states.

Importance of Electricity in Tennessee

There is no doubt that Tennessee is a heavy electrical energy-using state. The abundance of electrical energy in Tennessee since the 1930's has been a fulcrum of industrial development. We do consume more electrical energy per capita than people in any other state. In residential electrical sales per capita, measured in millions of BTU's (British Thermal Units), for example, Tennessee ranks first in the nation, at 20.906. While it is significant that Tennessee's consumption is the highest in the U.S., it is also significant that this residential electrical consumption rate per capita in Tennessee is twice the national average.

Why has electrical energy come to dominate Tennessee's energy use? Most likely there are two reasons. One is that whenever the price of one resource is low relative to other resources, people tend to adopt the usage of that resource in heavy amounts. The other is that because of its social and economic mission, TVA, in the past, has pushed the one resource most centrally at its control as the "developing" agent for the Tennessee Valley. In the 1950's and 1960's more use meant cheaper average



costs, and that was good. So there has been much historical proselytizing for electrical energy. The all-American electrical home of the 1960's is one way this worked its way out.

From the 1950, 1960, and 1970 Housing Censuses, Tennessee's record can be tracked, moving from a coal- and wood-dominated home heating fuel economy to an electricity-dominated economy. In 1970, only 4.5 percent of the 3,096 counties in the U.S. used electricity as their primary home heating fuel, but of these counties, fully half were located in Tennessee, and 67.1 percent were located in the TVA region that extends slightly outside Tennessee borders. The remainder were located in only seven other states (non-TVA portions of Georgia, Florida, Arkansas, Nevada, California, Oregon, and Washington).

Even beyond simple residential electrical usage, however, Tennessee ranks first in the nation in total electrical sales to the residential, commercial, industrial, and transportation sectors. Tennessee's 1978 total electrical consumption per capita was 2.75 times the national average. In comparisons even to the state of Washington, the next most extensive electrical-using place, Tennessee consumes 50 percent more electrical energy per capita.

Sources of Other Tennessee Energy

Figure 1 shows the percentages of total BTU's of energy consumed which come from major fuel or power sources: coal, natural gas, petroleum, and electricity. These numbers exclude from the consumption data the intermediate uses of coal, natural gas, and petroleum in electricity production. Therefore, the data can be interpreted as the consumption of fuels or power for end-use purposes, excluding the production of electricity. Figure 2 shows comparable national data.

While Tennessee electrical consumption has averaged 20 percent or more of total energy consumption for nearly two decades, electrical consumption in the U.S. has moved barely above 10 percent of total BTU consumption. Tennessee use of electricity relative to total energy is twice the U.S. rate. Since in 1978 our per capita usage of total energy was 16 percent higher than the U.S. average usage (Tennessee ranked 14th among the states), this figure corroborates that our per capita electrical consumption rates are well over two times the U.S. rate, consistent with the data already discussed. Over time, however, electrical consumption as a percent of total energy has remained nearly constant. Since 1975, if anything, the relative percentage of total energy taken from electricity has declined. This occurred during a time when TVA was adding to its capacity to make up for relatively massive amounts of electricity imported into its system from outside, these amounts accounting for more than 4.5 percent of the total TVA sales in 1975. In the meantime, U.S. electrical consumption has been a steadily rising component share of total energy use, doubling in two decades from nearly 6 to almost 12 percent.

Importance of Coal and Petroleum for Electricity Generation

As Figure 3 shows, comparing Tennessee and the U.S., Tennessee has not produced hydro-electrical power any more heavily than has the U.S. In the state, the percentage of total (nonnuclear) generation coming from hydropower has declined steadily to just 15 percent, precisely the percentage produced from hydro in the U.S. in 1978. What is more surprising is that Tennessee power comes predominantly from coal – 80 percent in Tennessee compared to 50 percent in the U.S. Further, Tennessee has never had much dependence on relatively higher priced gas as a fuel for turbines which are used to provide power during the highest consumption hours during the day. This power is known as "peaking" power.

The total consumption data, however, do report a growing dependence in Tennessee electricity production on petroleum since 1974. While the 1980 TVA **Annual Report** shows recent declines in petroleum use, the 1974-78 increase in petroleum use coincides with the country's biggest struggle with energy independence occurring since the 1972 shortage of foreign oil, when the basic policies of OPEC were formulated.

The increase in use of petroleum by utilities also coincides with a most disturbing trend, evident in Figures 1 and 2 that describe energy end-use by all sectors: while U.S. petroleum dependence seems to be in check, holding constant between 50 and 55 percent of total energy consumption, Tennessee use of petroleum has increased steadily from less than 35 percent of its total to nearly the national average – 55 percent.

Effects of Energy Mix on the Economy

Increasing petroleum use makes Tennessee all the more dependent on foreign oil production, a captive of foreign price control, and as economically sensitive to energy-related, cyclical swings as the rest of the U.S. These factors may add up to a reason why the rate of growth of Tennessee productivity has fallen right along with U.S. productivity. While U.S. manufacturing productivity rose 3.3 percent annually in the 1960's, it rose by only 2.5 percent in the 1970's. Similar data on Tennessee show that productivity rose by 4.2 percent in the 1960's and by only 2.9 percent in the 1970's.

As shown in Figure 4, unbridled increases in energy prices, nationally, relative to capital and labor prices (Panel A in Figure 4) have led to a falling energy/labor ratio. This has occurred because other productive inputs (labor and capital) are substituted for energy whenever energy price increases are greater than those of the other factors. Substitution of labor for energy is even further intensified, because in the short run the labor-for-energy substitution replaces the more difficult capital-for-energy substitution. In the 1980's, the economy should be

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stimulated by the eventual capital-for-labor and capital-for-energy substitutions that may be made. These simply require time, inventive capacity, and capital availability. The national capital/labor ratio rose by 28.5 percent from 1962 to 1972, but by only 3.7 percent from 1972 to 1979. Over the same time, the national energy/labor ratio rose 25 percent from 1962 to 1972 and actually declined by 8.3 percent from 1972 to 1979.

In Tennessee, good information is scarce on the capital/labor ratio, but the state's energy/labor ratio acted much like the U.S. From 1962 to 1972, it rose by 13 percent and then rose again, but by only 7 percent from 1972 to 1979.

This slowing of growth, masking the later downturn in the energy/labor ratio in Tennessee, is visible in Panel B of Figure 4 from 1975-76 and on. The slower growth or decline in the energy/labor ratio helps to explain the diminishing productivity of labor which must be replenished to provide real income gains in the 1980's. Increased dependence in Tennessee on petroleum-based products makes restoring Tennessee productivity a less certain outcome, somewhat controlled by foreign activity.

Decline of Natural Gas

Figures 1 and 2 also show a drop in use of natural gas within the state of Tennessee, dipping far below the national decline. This drop is likely to affect Tennessee's reaction to natural gas decontrol in the early 1980's, since many former gas installations already have been retrofitted for other fuels. But the effect of decontrol is unclear at the moment. Nationally, greater supply of gas at much higher prices is likely to be forthcoming. How much the state will use gas after decontrol depends largely on which is the predominant effect. Much also depends on as yet unformulated Reagan policies on natural gas use in utilities, industry, and residences.

The decline in natural gas use in Tennessee, historically, is understandable, considering the physical unavailability of gas and the relative price effects of oil, gas, and coal.

INCREASES IN THE UTILIZATION OF NUCLEAR FUEL IN TVA GENERATION WILL STOP SOME... ABSORPTION OF DISTILLATES INTO ... UTILITIES.

The decline in natural gas use in Tennessee, historically, is understandable, considering the physical unavailability of gas and the slower price increases of oil and coal. At this point, price decontrol now seems unlikely before 1985, but end-use controls may be dropped this year, making greater utility and industrial use of gas possible.

Detail of Petroleum Use

The reduction of petroleum dependence in Tennessee presents one of the biggest challenges in the decade ahead. As expected, given the price increases over the period from 1972 to the present, there is a decline in the relative share of motor gasoline consumption in the state, which shows a drop from 58 percent to 47 percent of total petroleum usage from 1960-1978. In absolute terms, the amount of gasoline rose, of course, from 1150.2 million gallons to 2588.4 million gallons during the period 1960-1978, and the price of gasoline has risen by 200 percent over the same time. While gasoline tax revenues rose 235 percent from 1960 to 1980, if they had been based on sales value, then even without changes in the tax rate, tax revenues would have more than quadrupled.

All of the electric utilities' use of petroleum comes from distillates, a component of total petroleum use that has been rather constant (as a percentage) over time. The increased use of petroleum distillates in electric utilities is therefore primarily a displacement of distillate use in other sectors. Increases in the utilization of nuclear fuel in TVA generation will stop some of this absorption of distillates into the utilities. As it does,

FIGURE 1

PERCENT OF TOTAL BTU's FROM FUELS AND POWER TENNESSEE

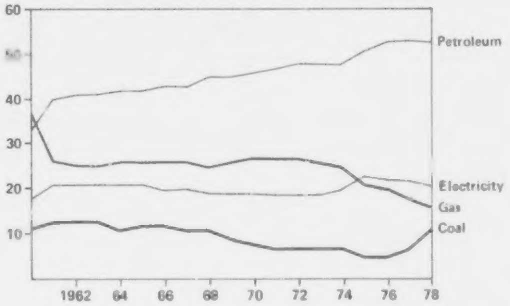
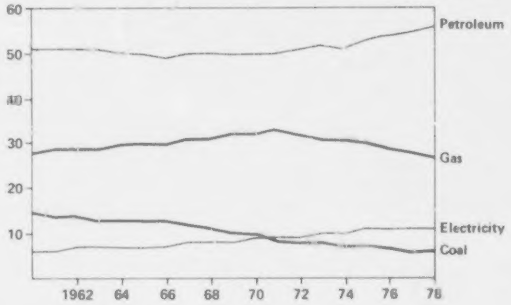


FIGURE 2

PERCENT OF TOTAL BTU's FROM FUELS AND POWER UNITED STATES



Note: Percents of total BTU's from fuels and power in Tennessee are derived by obtaining final consumption fuels by adding data from the State Energy Data Report (SEDR), April 1980, p. 359, for the state, and pages 13 and 15 – 19 for the U.S. on total coal, natural gas, and total petroleum, with the electricity sales reported on pp. 361 – 364, after subtracting consumption of total coal, natural gas, and total petroleum (p. 365). These data exclude the use of fuels as an intermediate input into electricity generation. Percentages are obtained by dividing the final consumption by each of the component parts used for final consumption.

Source: U.S. Department of Energy.

it will be possible to have greater utilization in other sectors without increased Tennessee dependence on foreign oil.

Summary

Three major factors can best summarize the situation in Tennessee:

(1) Tennessee is an extremely heavy energy-using state, ranking 14th in the U.S. in using energy of all kinds, per capita;

(2) Tennessee is more heavily oriented toward electrical energy than any other state, using more electrical energy in total and for residential purposes, per capita, than the other states;

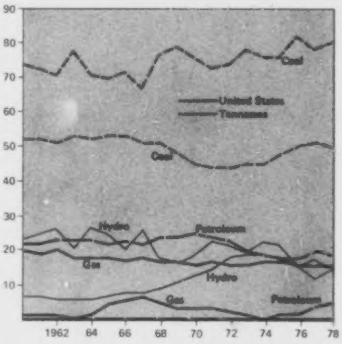
(3) Although the state is so electrically oriented, the real growth in the proportion of BTU's used in Tennessee has come from petroleum, and not electricity, petroleum now accounting for significantly more than 50 percent of all BTU's consumed in the state.

Of these features, the most surprising that has been shown is the growth in Tennessee consumption of petroleum. Many questions yet need to be answered about the impact of this factor on the Tennessee economy. Has the growth of petroleum use been a function of the expansion of the manufacturing sector of the economy? As a development strategy, is the state better off attracting more or less energy- and petroleum-intensive industries? What will be the impact of a curtailment in foreign oil on employment and output? Will the forces which have currently led to the specific choices of fuel mix and the dominance of petroleum use continue into the future? If conditions change, how expensive will be the changeover to new fuel mixes? With all these uncertainties, what is the most likely future growth of the Tennessee economy?

FIGURE 3

PERCENT FUELS AND POWER USED IN ELECTRICAL GENERATION

TENNESSEE VS. UNITED STATES



Note: Percentages of fuels and power used in generating electricity in Tennessee come from SEDR, p. 365, and U.S. figures from p. 19, dividing each of the components by the sum of total coal, natural gas, total petroleum, and hydroelectric power.

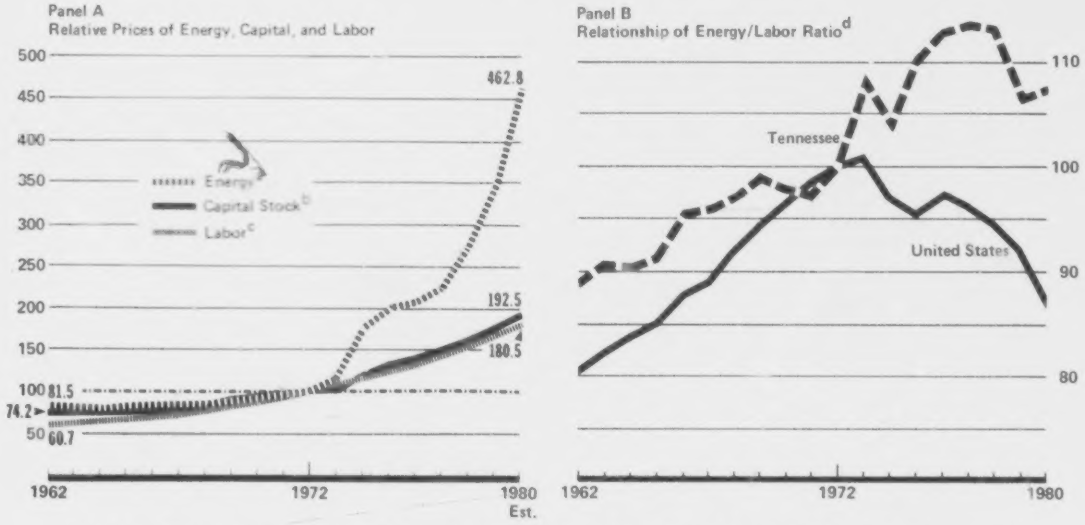
Source: U.S. Department of Energy.

FIGURE 4

FACTORS OF PRODUCTION

Energy, Capital Stock, and Labor

Ratio 1972 = 100



a. Producers Price Index, Fuels and Related Products and Power; b. Fixed Weight Price Deflator for Nonresidential Business Capital, c. Adjusted Hourly Earnings, Total Private Nonagriculture; d. Gross Energy Consumption in BTU's Divided By Total Civilian Employees.

Note: Panel A estimated by Ebasco Services, Inc., 1980 Business and Economic Chart Book. Panel B constructed by dividing the data on total energy consumption on pp. 3 and 359 of SEDR by Wharton Econometric Forecasting Associates estimates of U.S. total employment and by Tennessee Econometric Model estimates in *An Economic Report to the Governor of the State of Tennessee*, January, 1981, of Tennessee total employment. Data for U.S. energy consumption, 1979 and 1980, are estimated by the Center for Business and Economic Research, The University of Tennessee, Knoxville.

Source: U.S. Department of Energy, U.S. Department of Labor, U.S. Department of Commerce, and Ebasco Services, Inc.

Expanding Liability for Defective Products and Services

Mahlon L. Townsend

Warranty
Acme Unbreakable Gavel Co.

The proliferation of new products and services during the twentieth century has created such a need for new business and consumer laws that responsive lawmakers--judicial, legislative and administrative--have actually been developing a substantial new legal environment for these areas, especially during the last two decades. At both the federal and state levels the volume of new laws has been so enormous that affected persons often have been hard pressed not only to keep abreast of such laws but also to understand their application and significance.

Nowhere has this been more true than in the fields of product and service liability. The growing number of cases in which producers of merchandise, services, and even real estate improvements have been held liable to persons with whom they had no contractual or other known relationship has increasingly bewildered and stunned such defendants, especially when they have faced judgments amounting to hundreds of thousands or even millions of dollars. In some situations businesses have been liquidated in order to settle such claims, or because anticipated future risks were no longer acceptable. The realities of the current trend also are evident to business people confronted with either rapidly rising liability insurance rates or outright cancellation of coverage.

Despite the flood of statutory laws that have been promulgated in recent years, the courts themselves took the initiative in establishing new laws of liability for producers and others in the distribution chain. Demonstrating growing impatience with legislative bodies' inaction in protecting consumers from various types of damages, a number of progressive courts felt compelled to depart from established precedents that had long barred recovery of damages by certain classes of persons, consequently assuming the role of social engineers in developing the new rights and liabilities demanded by contemporary society. However, once the courts had demonstrated their determination to make such changes, state legislatures rapidly enacted laws to clarify, complement, and even broaden the concepts of liability that had been judicially initiated.

Although producers of goods and services are acutely aware of their expanded liabilities, many of them still find it difficult, if not impossible, to comprehend the recent legal changes that have taken place. This is understandable in view of the fact that the applicable law is complex to the person who possesses little or no formal legal education. Actually, much of the legal revolution that has occurred in this area centers around the concept of *privity* and its meaning and significance in our legal system, as well as the recent modifications to which it has been subjected.

Privity of Contract

Privity is a term that is easier to describe than it is to define. Many definitions have been attempted by both jurists and scholars. All attempts to explain it emphasize that it involves a relation or connection between parties involved in a contract relationship that excludes strangers to such contract, regardless of how interested they may be in its performance or nonperformance. Traditionally, no one has been permitted to maintain any kind of an action on the contract itself unless that party occupied a privity relation.

Torts-Contracts-Privity

During the long development of the present legal system, which began in England after the Norman Conquest, substantive law gradually achieved its contemporary classification into criminal and civil law, with civil law being further divided into contracts and torts. Contract law involves the creation and enforcement of legal rights and duties between persons by agreement, whereas tort law encompasses the creation and enforcement of legal rights and duties between persons by society through its law-making institutions, such as the courts and legislatures. A breach of such an involuntarily created duty can result in a tort liability to an injured person. Torts usually are classified as intentional, negligent, or strict liability torts. A lawsuit that is brought by an injured person because of a breach of contract or a tort usually seeks compensation.

The historical division of civil law into contracts and torts had many consequences, including development of different theories relative to a defendant's liability, not only as to whom such liability might extend, but also the amount of such liability. Furthermore, this division resulted in courts classifying all lawsuits into either contract actions or tort actions and requiring them to be predicated and pursued as one or the other of these two classes, together with proper observance of the many significant differences between them. Normally, a breach of contract alone did not create a tort liability to the other contracting party or any third party. Thus, damaged third parties who had no privity relation to the contract were unable to sue either for breach of contract or in tort, and thus had no legal remedy. However, as noted below, it is in this area that both the courts and legislatures have been instrumental in restructuring some of the significant common law rules during the last few years.

Liability for Defective Products

Liability for injuries caused by defective products is an area of the law in which the concept of privity has practically disappeared. Here the concept has been either eliminated or so deemphasized that it is now almost only of historical significance. For a long time it protected sellers, especially manufacturers, from liability to nonprivity purchasers of defective goods. However, coincident with the growing volume of manufactured goods that could not be readily inspected by purchasers, pressures mounted to find some way by which such purchasers could go through or around retailers to reach manufacturers.

The courts gradually established several exceptions to the nonprivity rule, holding manufacturers liable, sometimes for negligence and sometimes absolutely, for defective products that were imminently or inherently dangerous. But it was not until Judge Cardozo abolished the barrier of privity for a negligence claim in the noted New York case of *MacPherson v. Buick Motor Company*, decided in 1916, that the first major step was taken to free a purchaser who had sustained damages from the shackles of privity. Even this momentous decision was not a panacea for all injured purchasers because they had to establish negligence on the part of the manufacturer, and often this was impossible. However, the *MacPherson* case was eventually adopted by the other states and applied to a wide range of product losses.

By the employment of certain legal fictions, manufacturers were sometimes held liable to injured persons on the grounds of either misrepresentation or breach of express warranty (sometimes referred to as a "guarantee" by business people and consumers). This was especially the case when the purchase had been induced by manufacturers' statements in advertising and other forms of business solicitation. If such statements were construed to be false representations, an injured purchaser could either rescind the transaction or obtain damages, depending on the applicable law and facts. On the other hand, if the statements were construed as express warranties running directly to purchasers, appropriate remedies for breach of warranty were available. A Washington state court decided the landmark case of *Baxter v. Ford Motor Company* in 1932, in which it allowed recovery by refusing to apply the privity barrier in an express warranty case. This case became a precedent for courts in many other states to discard privity as an obstacle to recovery in an express warranty case.

Formerly, implied warranty liability to third parties was restricted primarily to food and drink cases, in which the privity barrier was abolished early. It was not until 1956 that a nonprivity plaintiff, whose house collapsed because of defective cinder blocks, was permitted to sue the manufacturer of such blocks. Four years later, in the celebrated New Jersey case of *Henningsen v. Bloomfield Motors, Inc.*, both the dealer and the manufacturer of a defective automobile were held strictly liable on an implied warranty of safety which could not be negated by a contract clause. Warranty privity was abolished, and the court held that such an implied warranty would run to any foreseeable purchaser or user of the product. This case was very influential in inducing courts in many other states to discard privity as a barrier to recovery in similar implied warranty cases.

A very significant stage in product liability was reached in a 1963 decision in the California case of *Greenman v. Yuba Power Products, Inc.* Here a manufacturer was held strictly liable in tort for injuries caused by the use of a defective power tool by a nonprivity user. This case set off a chain reaction of cases in which manufacturers and others in the distribution chain were held liable in tort without any privity consideration. In fact, many states, including Tennessee, soon passed statutes that facilitated such suits.

To date, the last significant stage in product liability has been reached by the enactment by some state legislatures of new laws to place certain restraints on product liability suits. Pressured by several trade associations representing manufacturers, retailers, insurance companies, and others who had become alarmed at the increasing number of

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product liability suits and the amounts of the judgments often awarded, the Tennessee legislature enacted such a law in 1978. Among other things, this new law provides for specified time periods in which product liability suits can be maintained, and also provides guidelines for determining the existence of a defective or dangerous condition, including recognition of the state of the art as a possible defense. Perhaps one of the most significant features is the protection afforded a nonmanufacturing seller from strict liability in tort, as well as the protection given any seller of goods in a sealed container from any type of product liability other than for breach of express or implied warranty. However, all such sellers (usually retailers) may be subject to any applicable type of product liability suit if the manufacturer is not subject to service of process or has been declared to be judicially insolvent.

Liability for Defective Buildings

At common law it was the rule that a building contractor could be held liable for damages resulting from negligence during the course of construction of a building, but such liability ceased when the owner accepted the completed building. However, in this area the courts have also made inroads on the privity rule, and, by devising a number of exceptions, have permitted third persons to proceed against contractors. Although such liability has not yet reached the present stage of product liability, the gap seems to be narrowing, and liability has resulted from faulty design as well as faulty construction.

Another area of building construction is also experiencing radical judicial changes relative to liability. Formerly, it was the law that a vendor-builder was not liable for damages suffered by the purchaser of a new house because of the rule of *caveat emptor*. Here again, the concepts of product liability are exerting pressures, and courts are beginning to hold that a builder may be liable not only to the immediate purchaser but also to a nonprivity third person. One of the leading cases in this area is the 1965 New Jersey case of *Schipper v. Levitt & Sons, Inc.*, in which a large national builder erected and sold a new home with a defective hot water system. The purchaser later rented the house to a third person whose son was badly scalded. The builder was held liable on the theory of breach of an implied warranty which protected the nonprivity child. A number of courts in other jurisdictions have held vendor-builders similarly liable. Although strict liability on implied warranty, without privity limitations, has been the usual basis of such liability, some cases have been decided on the basis of negligence or misrepresentation.

An increasing number of cases, as well as the appearance of a number of federal and state statutes and regulations, indicates that certain classes of professionals, especially accountants and lawyers, are having to assume increased liability to both their clients and third parties.

Finally, it should be noted that vendor-builder liability usually is restricted to builders who are in the business of building and selling new homes. In most cases the defendant has been a mass producer of homes. The developing concept of vendor-builder liability has not reached the contemporary stage of product liability, but recent cases clearly indicate the direction in which it will continue to develop.

Liability for Defective Services

Since judicial standing for nonprivity third parties has been firmly established in several other areas, it would be natural to assume that the privity barrier would also yield in third party claims against professionals such as accountants, lawyers, architects, etc. Yet, not nearly as much progress has been made in the field of liability for defective services (usually involving information) as has occurred in the products field. However, an increasing number of cases, as well as the appearance of a number of federal and state statutes and regulations, indicates that certain classes of professionals, especially accountants and lawyers, are having to assume increased liability to both their clients and third parties.

Since the accounting profession seems to have been the focal point for judicial re-examination, most of the concluding remarks will be addressed to this profession. Volumes have been written about a number of accounting cases in which decisions have been interpreted, analyzed, praised, and criticized, and no useful purpose would be served in going into such cases in detail. Consequently, only a few of them, together with discernible trends, will be noted.

It is possible that the starting point for establishing an accountant's liability goes back to the English case of *Derry v. Peek*, decided in 1889, in which the court held that a tort action for deceit could not be based on a defendant's good faith statement, although deceit might be found if a misrepresentation was made with a reckless disregard for the truth or falsity of the statement. This was eventually adopted by most American courts, although a minority of them rejected it. Consequently, the prevailing rule in this respect is that an intentional or fraudulent misrepresentation is actionable, but a mere negligent misrepresentation furnishes no basis for tort liability.

One of the first important accounting cases was that of *Landell v. Lybrand*, decided in 1919, in which public accountants were sued by an investor who suffered a loss resulting from a purchase of worthless stock after relying on a defective financial statement prepared by the accountants. The court held such accountants were not liable for ordinary negligence if the third party was a stranger to them. In other words, there was no duty owed the plaintiff, and consequently, the accountants were not liable.

A landmark case in this area was that of *Ultramares Corp. v. Touch, Niven & Co.*, decided by Cardozo in 1931. Here again, a third party suffered a loss after relying on a defective financial statement prepared by public accountants. Although the case involved both intentional and negligent statements, its importance concerns the negligent statements. Judge Cardozo stated that ordinary negligence would not justify a finding of liability, but if the negligence was so gross as to amount to a constructive intent, liability might arise. It is interesting to note that Cardozo was the same judge who willingly abolished the privity barrier in the *MacPherson* negligence case in 1916.

Although accounting cases seem to have been the bellwether in the developing case law relative to liability to third persons for defective services, cases have appeared in other fields which indicate that many other types of suppliers of defective services are facing increasing liability, especially in such fields as law, abstracting, appraising, construction, and architecture.

Seven years after the *Ultramares* case was decided, another New York court decided the case of *State Street Trust Company v. Ernest et. al.*, which was factually similar to the 1931 case. Here it was held that the negligence of the accountants was so gross and inexcusable that it amounted to a constructive intent, and, consequently, they were held liable in tort to the third person.

One of the final stages in the developing liability of professionals is illustrated in the Rhode Island case of *Rusch Factors v. Levin*, decided by a federal court in a diversity of citizenship case in 1968. In this case accountants were held liable to a nonprivity third person for a loss caused by ordinary negligence. Although a few other courts have similarly held, there is at present no established common law to this effect in most jurisdictions, but the trend may be ominous for accountants.

Although accounting cases seem to have been the bellwether in the developing case law relative to liability to third persons for defective services, cases have appeared in other fields which indicate that many other types of suppliers of defective services are facing increasing liability, especially in such fields as law, abstracting, appraising, construction, and architecture. In some states, statutes impose such liability on persons performing specified services, such as notaries, food inspectors, and title abstractors. Most of the cases involving liability to nonprivity persons are based upon intentional misrepresentation or breach of a statutory duty, although a number of cases impose liability for negligent misrepresentation despite the prevailing tendency of the courts to deny such liability. Strict liability in tort, without negligence, warranty, or misrepresentation such as is frequently applied in product liability cases, has not yet achieved significant recognition in cases involving defective services, although the current trend of expanding liability here, as elsewhere, may very well presage a future acceptance of such liability.

Conclusion

Just as surely as necessity is the mother of invention, the vast changes which are occurring in the areas of production, distribution, and consumption are reflected in the concomitant changes taking place in the legal system. Perhaps in no other period in recent history have business people and consumers been subjected to so many new legal concepts of rights and liabilities. Furthermore, the trend will probably continue indefinitely, due in part, perhaps, to the growing complexity of our economic system, which demands a greater degree of accountability from producers of all types of economic goods and services. Like it or not, business and professional people will have to assume such liability as part of their costs, which obviously will be passed on to consumers. However, to the extent that such liabilities can be minimized, a competitive edge can be achieved which in the long run may spell the difference between demise and survival. ■

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